ARMY AIRMOBILITY HANDBOOK

UNITED STATES ARMY INFANTRY SCHOOL

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FOR THE CHIEF:

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The United States Army has embarked upon a bold new dimension in the science of warfare through the dynamic impact of the Airmobility Concept. Tested in combat and proven successful, the Airmobility Concept has enabled our Army to increase significantly the battlefield potential of our most valuable asset, the individual combat soldier. Obviously an Army that possesses the capability of rapidly emplacing airmobile soldiers who are both physically fit and highly motivated, on or near their objective areas without regard to terrain obstacles, has a distinct tactical advantage in any conflict. The tactics and techniques we are developing to employ the tremendous potential of the Airmobility Concept, with modifications to fit the specific situation, might very well be the pattern for any future warfare, regardless of its intensity. Since we have broken the "ground barrier," we are able to focus our combat strength on the enemy with far less concern for seizure of the traditional high ground. We are responding rapidly and violently to exploit the effects of our fantastic level of firepower. We have been able to mass a balanced combat force in a time frame that would have been thought to be inconceivable a few years back. We have been able to find, fix, fragment, and destroy the enemy with his own sanctuaries, and finally, we are able to disperse quickly our combat forces to areas where they are much less vulnerable to enemy retaliation. In short, our Army has established a new form of warfare that does not necessarily adhere to fixed battle lines, but is restricted only by the practical range of its organic aerial vehicles which provide its high degree of mobility; a form of warfare that not only requires, but demands men who are capable of thinking and acting on the fly.

ROBERT H. YORK
Major General, USA
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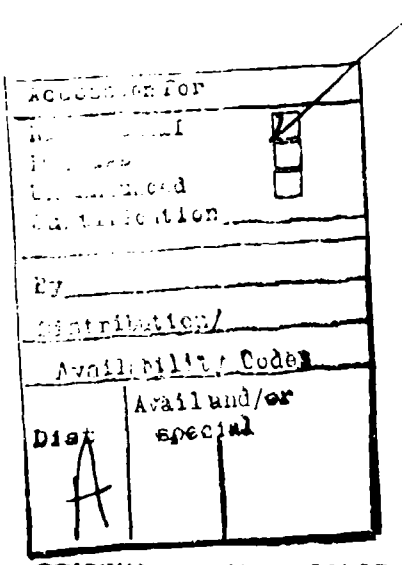

This handbook has been prepared by the Tactics Group, Brigade and Battalion Operations Department, United States Army Infantry School, and is approved for resident and extension course use by the United States Army Infantry School only. It reflects the current position of the School and conforms to printed Department of the Army doctrine as closely as possible.

This handbook consists of 7 Chapters and 9 Appendices, the title of each is indicated on the right hand margin of this page. To facilitate use of this handbook, a tabbing system is indicated on this page related to each Chapter and Appendix.

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CHAPTER 1

PREFACE

1.1 PURPOSE AND SCOPE.

a. This Handbook incorporates guidance, doctrine and tactics required to plan and execute airmobile operations. It is specifically designed for resident and extension course students of the United States Army Infantry School to provide the student with a knowledge of how to apply the Army Airmobility Concept to enhance land combat effectiveness.

b. This Handbook deals with all aspects of airmobile operations, emphasizing the tactical employment of light observation (LOH), utility, and medium helicopters, both transport and armed. It also covers, in lesser detail, the tactical employment of heavy cargo helicopters, fixed wing aircraft, and organizations and equipment associated with Army aviation. It provides basic and general information, and detailed information where required, providing the student with the necessary background to plan and conduct airmobile operations from small patrol to brigade-size.

c. Users of this Handbook are encouraged to submit recommended changes or comments for improvement. Comments should be forwarded to Director, Brigade and Battalion Operations Department, United States Army Infantry School, Fort Benning, 31905.

1.2 REFERENCES.

a. This Handbook is based on existing tactical doctrine and technical procedures, and is liberally supplemented by techniques and procedures established on the battlefield in the Republic of South Vietnam--today's doctrinal proving ground for airmobile operations.

b. A detailed Bibliography and Reading List is found in Appendix IX.

1.3 GLOSSARY OF AIRMOBILE TERMS AND ABBREVIATIONS. Airmobile terms and abbreviations used in this Handbook are defined in Appendix I. Many of the terms and abbreviations used herein are not listed in AR 320-5 (AD) and JCS Pub 1 (JD) or the present family of FM's and TM's; however, to insure clarity and a common language in the rapidly expanding field of airmobile operations, these terms are introduced here. Familiarization with Appendix I prior to using this Handbook is recommended to assure better understanding of the material contained herein.

SECTION I

THE AIRMOBILITY CONCEPT

1.4 THE AIRMOBILE FORCE. The basic difference between airmobile units and other land forces lies in the many advantages which airmobile units accrue through the use of aerial vehicles as the prime method of movement. The speed of reaction, the decrease of fatigue in combat elements, and the expanded areas of operational influence are only a few of the more obvious considerations. There also are some constraints such as sensitivity to weather, though this becomes an advantage when weather permits helicopter operations but precludes enemy fighter flights. The change in means of transportation requires recognition of the peculiarities in airmobile planning and execution. The concept of Army airmobile operations provides for the use of aerial vehicles to compensate for and seek a better balance among the five functions of combat power: mobility, firepower, intelligence, combat service support and command and control.

1.5 CONCEPT. This concept was developed to meet the need for improved ease and speed of battlefield mobility. Improvements in the areas of command and control, intelligence, support, and firepower occurred as a result of the improved mobility afforded by air vehicles. Today's commander has at his disposal the most advanced means of mobility ever enjoyed on any battlefield in the history of warfare. Even with this staggering advantage the commander cannot succeed without the knowledge of how to use this mobility. Improved battlefield mobility is the substance of the Army Airmobility Concept.

1.6 MISSION OF ARMY AVIATION. The mission of Army Aviation is to augment the capability of the army to conduct prompt and sustained operations incidental to land warfare.

a. Army aviation accomplishes its missions by augmenting other organic means of mobility through use of aircraft which are capable of avoiding concentrations of enemy firepower and ground obstacles.

b. Aviation resources are organized, trained, and equipped for responsive support of sustained combat incident to operations on land.

1.7 STRATEGIC AND TACTICAL MOBILITY.

a. Strategic mobility is accomplished by the Air Force, while the tactical airmobility role is primarily carried out by Army aviation.

b. The Infantry and Airborne Infantry divisions gain maximum use from Army aircraft due to the immediate availability of organic aviation with troop lift capabilities, and their organization adaptability to Army aircraft. All Army units properly organized and lightly equipped can increase their maneuver/mobility through employment of Army aviation.

c. All airmobile operations should be based on the premise that dismounted mobility will be the primary means of maneuver upon landing in the objective area. Limited mounted mobility will be available to the assault echelon, therefore the force must be organized for combat placing heavy reliance upon continued use of helicopters.

d. The capability to maneuver with Army aviation resources after the landing of the assault echelon is governed by the total aviation assets, immediate availability of these assets, and available landing zones (LZ's) and pickup zones (PZ's).

1.8 EMPLOYMENT OF AN AIRMOBILE FORCE.

a. An airmobile force employs aviation resources to enhance mission accomplishment. These resources give the force a verticle assault capability, additional firepower, and a greater mobility differential. There are distinct advantages and disadvantages which characterize airmobile operations.

(1) The advantages are:

(a) An airmobile force can more rapidly exploit success.

(b) Airmobile forces can be landed directly on or in close proximity to the objective.

(c) Airmobile forces can rapidly concentrate, disperse, or redeploy, thus posing a constant threat to the enemy.

(d) Airmobile forces can attack from any direction, strike objectives in otherwise inaccessible areas, overfly barriers, and by-pass enemy positions.

(2) Disadvantages are:

(a) The airmobile force is subject to weather restrictions not imposed upon ground forces.

(b) The airmobile force is limited as to the type and quantity of supporting weapons and heavy equipment that can be airlifted into the objective area.

(c) The airmobile force is dependent upon an air line of communications, the failure of which will limit sustained operations or dictate early ground link-up.

(d) The airmobile force can not operate with full effectiveness until US Forces obtain air superiority and suppress ground fire.

(e) The airmobile force has a limited capability to engage in sustained combat without substantial reinforcements; it is particularly vulnerable to enemy armor.

b. Maximum benefit of airmobility can be fully realized by the commander who applies these basic considerations of Army aviation employment throughout his planning and execution.

(1) Immediate Availability. The opportunity to employ aviation to the best advantage will often come suddenly and require that supporting aviation units be immediately available and responsive to the supported commander's requirements. Availability is facilitated by flexible aviation unit organization, mobility, proper scheduling of personnel and aircraft, adequate maintenance support and by locating aviation resources near the supported unit.

(2) Freedom of Utilization. Freedom of utilization permits the commander to employ organic, attached, or supporting Army aviation units in the way which contributes most to the successful accomplishment of his mission. Organic assignment provides the commander with greater freedom of utilization than attachment, and attachment provides greater freedom of utilization than operational control. Maximum freedom of utilization is obtained by assigning the necessary degree of control of supporting aviation to the supported commander.

(3) Economy of Utilization. There is seldom enough aviation support to satisfy all justifiable demands. Aircraft should not be used when surfaces means are equally effective. Therefore, economy must be practiced and missions assigned on a priority basis. Proper coordination and command control promotes the most effective use of Army aviation. Although there is more aviation support available to the commander today than ever before, there still is insufficient aircraft to meet all demands. For this reason it is most important for the supported commander to adhere to economy of utilization of aviation resources as follows:

(a) Utilize the most appropriate aircraft available for the mission. Do not send a utility helicopter when the LOH can accomplish the mission.

(b) Request only the required aviation support for the mission.

(c) Once the mission is completed release the aircraft for other missions or maintenance.

(4) Tactical Integrity. Tactical integrity is essential to both the aviation unit and the ground unit during airmobile operations for close coordination, effective teamwork, and positive control.

c. Other factors affecting employment of airmobile forces are:

(1) Dispersion and Mass. Airmobile forces are capable of massing, dispersing and redeploying more readily than other units. They are able to extend themselves and remain mutually supporting through flexibility of committment over distances not possible with less mobile units. Airmobile forces may remain dispersed prior to committment, utilizing camouflage and other passive defensive measures to avoid detection. When committed, the units mass at a central loading zone or "join up" enroute to land simultaneously in the objective area. After accomplishment of the mission, the Airmobile Force (AMF) again disperses before the enemy can react.

(2) Time Distance. An airmobile force can be employed anywhere within the radius of the aircraft utilized.

(a) The time distance factor may determine in large measure the number of aircraft that can be economically used to accomplish the mission. Generally speaking, the shorter the time interval from the loading zone to the LZ, fewer helicopters should be utilized for safer, more efficient operations. This is particularly true if the size of the loading zone or LZ is restrictive as to the number of helicopters that can be landed at one time. A good "rule of thumb" to apply in order to determine the required number of helicopters for a "short haul" mission is to use only that number of helicopters that can safely land at one time in the loading zone or LZ. A turn around time of four minutes or less can be classed as a "short haul" operation. Limited airspace on a short range mission restrict the number of aircraft that can be used efficiently.

(b) The maximum distance is based on the ability of the helicopter to deliver the assault force and return to the nearest staging area (refuel/rearm point). Airmobile operations in Vietnam are conducted almost daily over distances from less than one kilometer up to 140 kilometers, from loading zone to LZ. Too often the helicopter is brought into the operation only when the longer moves are considered. Actually, great dividends can be reaped from frequent short maneuvers by helicopter. Maximum advantage can be taken by using helicopters to move forces across rivers, around lakes or swamps, over mountains, or even the pickup of a force at the base of a mountain with a dropoff on the top of the same mountain to minimize troop fatigue. No distance is too short if combat efficiency is improved by airmobility.

(3) Combat Support Units. Another factor that should always be considered in terms of distance is the range of supporting fires. It is desirable to commit the AMF within the range of responsive supporting fires. The combat support units of an AMF must be as maneuverable as the combat units. Medium lift helicopters provide the lift capability to allow combat support units to accompany the AMF for continuous responsive support. Armed helicopters provide column escort and aerial fire support enroute and in the objective area right up to touchdown of transport helicopters.

d. The tactical employment of airmobile forces is discussed in detail in Chapter 7.

1.9 AIRCRAFT RESOURCES. The commander who has aviation support must be constantly on the alert to determine the time and occasion for the most advantageous committment of his highly mobile force. With an airmobile capability the commander can rapidly mass and disperse his combat power. This ability allows him to pose a complex and constant threat to the enemy, and to rapidly strike a dispersed enemy and withdraw by air before the enemy can react in force. If the enemy chooses to consolidate and shorten his frontages to counter the threat, he will present lucrative targets for air and artillery strikes. The resources that can be made available include the LOH, utility, medium and heavy helicopters, as well as fixed wing aircraft. However, assault echelon support will be primarily LOH and utility helicopers.

1.10 ECHELONMENT OF FORCES FOR AIRMOBILE OPERATIONS. The airmobile force is normally organized into three echelons for operations, the assault echelon, the followup echelon, and the rear echelon.

a. The assault echelon contains combat elements, command and control elements, personnel, and equipment essential to the initial success of the operation in the landing zone.

b. The followup echelon consists of those elements not included in the assault echelon which are necessary for mission accomplishment in the objective area.

c. The rear echelon consists of those elements required in the staging area to conduct administrative and logistical support of the operation.

SECTION II

AIRLIFT OF PERSONNEL AND MATERIEL

1.11 MISSION REQUIREMENTS AND FACTORS.

a. The airlift of personnel and materiel within the combat zone is a major function of Army aviation. It includes the movement of maneuver and fire support elements to execute airmobile operations, the movement of reserves, the shifting and relocation of units and individuals within the combat zone, and air movement of equipment and supplies.

b. Requirements for the airlift of personnel and materiel by Army aircraft are generated by

(1) The need for attaining tactical advantage.

(2) The need for speed and flexibility.

(3) The presence of inadequate surface routes of communications due to enemy action, terrain obstacles, rapid advance of friendly forces, or the isolation of friendly forces.

(4) The need for reinforcement of threatened areas.

c. Basic factors for use of Army airmobility are:

(1) Availability of aircraft of suitable speed, range, and payload.

(2) Facilities and terrain characteristics at rear airfields, intermediate landing points, and terminal landing areas.

(3) Weather conditions.

(4) Air supremacy.

(5) Availability of trained personnel to load, unload, and operate aircraft.

(6) Time available.

(7) Enemy air defense capability.

(8) Availability, adequacy, and relative savings of time, men, and materiel as compared to use of other means of transportation.

1.12 AIRLIFT OF PERSONNEL.

a. Staff Procedures. The unit requesting airlift of personnel is responsible for planning the movement and the necessary coordination with higher, lower, and adjacent units. The unit aviation officer or the supporting aviation unit liaison officer assists in the planning. Aircraft for airlift of personnel normally are assigned on a mission basis with aviation unit integrity maintained as much as practicable. Aviation unit planning to support the mission is based on the plans of the supported unit. SOP for air movement of troops should be developed at all levels by supported units as well as aviation units.

b. Methods. Methods by which airlifted personnel can be delivered into objective areas include:

(1) Airlanded. Personnel moved by air can disembark after the aircraft has landed, or from a hover.

(2) Airdrop. Special units can parachute from aircraft in flight.

(3) Trooper Ladder. Trained troops can use ladders to descend from hovering helicopters unable to land because of terrain obstacles.

1.13 AIRLIFT OF MATERIEL.

a. Staff Procedures. Requests for aerial delivery of materiel will be sent through logistical channels. The allocation of Army aircraft for this mission rests with the AMF commander. Normal staff procedures are followed. Most aviation units are not authorized cargo slings and nets. When this requirement exists, additional slings or nets are obtained through supply channels by the supported unit. The aircraft commander will supervise the loading of supplies and equipment. For details covering these procedures, see FM 1-105 and FM 10-8, and TM 10-500-6, TM 55-450-8, and TM 55-450-9. Planning for this type of movement will include:

(1) Delivery priorities to allow for differing load capabilities of specific aircraft and for weather conditions.

(2) Pickup and delivery points.

(3) Refueling when long distances are involved, or when limited fuel is carried to increase payloads.

(4) Communications with and identification of units which are to receive supplies.

(5) Methods of delivery (b. below).

(6) Establishment of landing or drop zones.

(7) Plans for use of pathfinders at landing or drop zones.

b. Methods of Delivery. Methods by which airlifted materiel can be delivered to using units by Army aircraft include:

(1) Airlanded. Materiel moved by air is unloaded after the aircraft has landed. During the airlift, this materiel may be carried internally or externally by fixed wing or rotary wing aircraft.

(2) Airdrop. Materiel can be delivered from Army aircraft in flight by:

(a) Free dropping (without the use of parachutes).

(b) Use of cargo parachutes.

c. Airmobile Operations. In airmobile operations, the operations plan will include the requirement for delivery of equipment and supplies. The supported unit will prepare and load its own equipment and supplies. Loading of the aircraft will be accomplished under the supervision of the aircraft commander.

CHAPTER 2

COMMAND AND CONTROL

Command and Control is an arrangement of personnel, facilities and the means for information acquisition, processing and dissemination employed by a commander in planning, directing and controlling operations.

This chapter addresses the personnel arrangements for effective Command and Staff actions; the available facilities to enhance the exercise of Command and Control; and the staff action and procedures to acquire, process and disseminate information essential for proper planning, directing, and controlling airmobile operations.

SECTION I

COMMAND AND STAFF

2.1 GENERAL. This Section explains the command and staff arrangements to coordinate the acquisition, processing, and dissemination of information, necessary to direct an airmobile operation and the personnel arrangements by which the staff coordinates these essential details.

2.2 COMMAND. Command of an airmobile force is rendered more difficult than other ground units by virtue of greater dispersion, longer lines of communication and complexities inherent in transportation of forces to objective areas by aerial vehicles.

a. It is virtually impossible for a commander to accomplish all necessary tasks incident to the planning and execution of an operation effectively. He must delegate performance of some of these duties to his staff for accomplishment. Yet, as in other organizations, the commander remains responsible for everything his unit (including the staff) does or fails to do.

b. Proper utilization of the staff insures maximum flexibility in the execution of orders. The commander uses his staff to acquire information; make recommendations; prepare estimates, detailed plans, and orders implementing his decisions; coordinate plans and operations and relieve him or other details. He establishes definite functional responsibilities for his staff and insures that adequate authority is delegated commensurate with that responsibility.

2.3 COMMAND AND STAFF ACTIONS. The AMF Commander is responsible to determine how his maneuver elements will be employed and how available support will be applied, to accomplish the mission. He relies on his staff to make sound recommendations in their areas of primary responsibility and to assist in implementing his decisions. The sequence of command and staff actions does not vary in an airmobile operation from the normal sequence. Due to the speed which may characterize airmobile operations, certain of these procedures may be accelerated for maximum effectiveness.

a. Mission analysis. After determining the specific and implied tasks from the airmobile mission, the AMF Commander issues his preliminary guidance to the staff. Every effort should be made as early as possible to issue a warning order and to coordinate with the supporting aviation unit commander.

b. Planning Guidance. The guidance which a commander gives his staff for planning may be as general or as detailed as he desires. It is designed to provide the necessary direction for concurrent planning by each staff member and for the preparation of staff estimates.

c. Staff estimates. Each staff officer continues to revise and improve his staff estimate. These are focused on a specific staff area of responsibility to insure proper consideration is given to those circumstances which may affect mission accomplishment. Coordination between staff officers is a continuing requirement in order to present a coordinated recommendation to the commander.

d. Commander's Estimate. Based on the recommendations of his staff, the AMF commander will complete his estimate and formulate his decision for the conduct of the operation.

e. The Decision. The AMF commander's decision is a concise statement of the general scheme of maneuver for the operation. It normally includes, as a minimum, the mission, time of landing, allocation of aviation resources, objectives for each maneuver unit, and missions for the reserve.

f. Commander's Concept. After stating his decision, the commander will provide the staff with his concept of how the operations will be conducted. This is merely an elaboration, to the extent the commander desires, on the decision. The concept may include:

(1) The purpose of the operation.

(2) The scheme of maneuver to include phrasing, organization for combat, security measures, etc.

(3) Use of fire support to include nuclear weapons employment.

(4) Combat service support.

g. Issuance of orders. Based on the commander's decision and concept, the S3 will assemble the input from other staff officers and complete the plan or order. After receiving the commander's approval the order is issued for subordinate elements. The preparation of the order for an airmobile operation follows the reserve planning method.

h. Execution and Supervision. After the order is issued, the commander, assisted by his staff, supervises its execution. The staff will coordinate with and assist subordinate and supporting units, where necessary, in the implementation of the order.

2.4 TROOP LEADING PROCEDURES. The foregoing actions describe functions taken by the AMF commander and his staff to prepare, issue, and execute an order. Troop leading procedures are a logical sequence of actions, or thought processes, which a commander may take in developing his tactical plan. The command and staff actions represent the manner in which the staff assists the commander in executing troop leading procedures.

a. The recommended sequence of troop leading procedures is:

(1) Begin planning as soon as the mission is received.

(2) Arrange for reconnaissance, movement of forces, coordination with supporting units, and issuance of planning guidance to the staff.

(3) Continue planning and announce the decision and concept.

(4) Complete the plans for employment of tactical and support units.

(5) Issue the order, either verbally or in writing.

(6) Supervise the operation and modify orders as required.

b. A major consideration in troop leading is to provide the subordinate commanders with adequate time for their planning, reconnaissance, issuance of orders and supervision. Frequently, in a fast moving airmobile operation, the commander will meet his staff and/or commanders well forward to receive estimates, issue planning guidance or announce his decision. He may accomplish these troop leading steps in the C&C helicopter (See Section III) on his return from his reconnaissance.

2.6 PLANNING AN AIRMOBILE OPERATION.

a. Warning order. A unit which is to conduct an airmobile operation will normally receive a warning order to provide advance notification of an impending operation. The AMF commander has an immediate responsibility to issue warning orders to each of his subordinate and supporting units. These warning orders should include, as a minimum:

(1) Type operation (who, what, and when)

(2) Type aircraft and numbers available.

(3) Proposed ACL for each type aircraft.

(4) Designation of supporting aviation unit and reporting time and place for aviation liaison officers.

b. Ground tactical plan. In planning for an airmobile operation the reverse planning sequence is applied. The ground tactical plan (Section II, Chapter 6) is first developed to best accomplish the assigned ground mission. It is first necessary to determine where and in what strength the combat power is to be positioned. Then, working in close coordination with the aviation liaison officer, or the commander of the supporting aviation unit, determine what aviation resources can be made available to support the operation. The aviation liaison officer will inform the AMF commander of deficiencies of required numbers or types of aircraft and any restrictions on the availability of landing zones, to place combat power where the AMF commander desires. The original plan is then modified to best accomplish the mission within any restrictions on availability of aircraft or landing zones. Frequently the original plan can be modified by proper scheduling or by tailoring the combat forces to compensate for limitations imposed by inadequate aircraft. The aircraft requirement should be stated in terms of units of lift, rather than numbers of specific types of aircraft, to permit the supporting unit to tailor his resources to satisfy the intended purpose. The requirement for tactical integrity of the AMF can be satisfied during this initial coordination between the AMF and supporting aviation unit staffs.

c. Supporting plans. Preparation of the various supporting plans can begin only after the ground tactical plan has been finalized.

(1) The landing plan prescribes the organization of the landing zones to permit ground forces to be landed as near as possible to the objective and in the desired formations (Section III, Chapter 6).

(2) The AMF commander selects flight routes from the loading zone to the RP's, based on the advice of the aviation commander or LNO. This becomes the air movement plan. (Sec IV/6).

(3) The organization of the loading zone -- or the loading plan -- is then jointly planned by the aviation unit commander and the commander of the AMF. (Chapter 6, Sec V)

d. Throughout the planning sequence, times must be computed from the desired LZ time to the loading time. If the aviation unit is not located at the loading zone, the aviation commander must also plan his time from loading time to take-off time at his base camp or staging area in order that his flights arrive on time at the loading zone.

e. The plans described above become annexes to the operation order. Other plans which should be included in the operation order for the airmobile operation are plans for the defense of the objective area, plans for linkup, if such is planned; and plans for withdrawal by air, should such become necessary.

SECTION II

TACTICAL MISSIONS, COMMAND RELATIONSHIPS AND RESPONSIBILITIES

2.7 TACTICAL MISSIONS AND COMMAND RELATIONSHIPS. To plan and conduct effective airmobile operations, the supported commander must know how to utilize the capabilities of his supporting aviation. To do this he must fully understand the tactical missions and command relationships under which the supporting unit may be assigned. The terms used to designate these relationships and missions are common to all combat support and combat service support elements. It is important to remember that supporting aviation should be under the control of the supported commander at the lowest level of command that has the authority and the capability to plan and control the aviation resources.

a. An aviation unit may be assigned the command relationship as an organic part of a force, as an attachment to a force, or under the operational control of a force commander (See Table I).

(1) Organic Assignment. An organic assignment is authorized by TOE or by modification TOE and is permanent in nature. The ultimate goal of assignment of Army aviation is to place support at the lowest user level requiring continuous and immediate support. The using echelon must have the means to plan for and control the use of this aviation. Organic aviation is then the most immediately available and responsive relationship to provide aviation support to a ground commander.

(2) Attachment. An aviation unit may be attached to a maneuver element or to another aviation unit. In addition to complete control, the gaining commander is responsible for providing the logistical and administrative support for the attached unit unless stated otherwise. Should a supported unit be unable to provide the required support, the attachment order may limit the amount of service support to be provided. Subject to limitations imposed by the attachment order, the supported commander of the organization receiving the attachment will exercise the same degree of command and operational control over the attached unit as he does over units organic to his command.

(3) Operational Control (OPCON). OPCON places an aviation unit under a supported command for assignment of tasks, designation of staging bases (LZ's and PZ's), composition of forces and authoritative direction necessary to accomplish the mission. Operational control gives the gaining commander the authority to tailor or group forces and position subordinate units as he deems necessary. It also provides him the command authority to direct the efforts of those units. OPCON does not imply responsibilities for administration, combat service support, discipline, or training; or authority to alter internal organization. Services support responsibility is not imposed on the AMF commander exercising operational control unless, as a result of the nature of the operation, units become divorced from habitual service support channels or by mutual agreement between supporting and supported unit commanders.

b. An aviation unit can also provide direct support (DS), general support (GS), or reinforcing (REINF). These methods of employment provide a wide range of selection in the degree of control and the responsibilities of supporting aviation commander. The determination as to which role is appropriate should provide the minimum degree of control necessary to accomplish the mission. (See Table I).

(1) Direct Support. Direct support requires the supporting aviation unit to establish liaison and communications with the supported unit. The DS aviation unit commander positions his unit and coordinates its activities with those of the supported command as necessary to properly accomplish the support mission. The aviation unit commander is the final authority on technical and flight aspects of the operation; i.e., aircraft capabilities, weather contingencies, suitability of flight routes and landing zones. These prerogatives do not permit

denying support where divergent viewpoints exist, between the supporting and supported commanders, concerning the tactical soundness or military worth of the support being requested. Command and service support responsibilities remain within the aviation organization.

(2) General Support. General support is that support given supported forces as a whole and not to any particular subdivision thereof. An aviation organization in general support monitors and establishes priorities on mission requests from supported units and positions the unit as necessary to accomplish the support requirement. Liaison need not be established with supported units unless specified by higher headquarters. Command and service support responsibilities rest with the aviation organization. The commanders involved must rely heavily on cooperation between units for complete success under this relationship.

(3) Reinforcing. An aviation unit assigned the mission of reinforcing, augments the aviation support capabilities of another aviation unit. The reinforcing unit remains under the command of the commander who assigned the reinforcing mission, but the flight missions are planned and controlled by the reinforced unit. A direct communications channel is established between the reinforcing and the reinforced units, and the reinforced unit calls directly upon the reinforcing unit for flights.

2.8 RESPONSIBILITIES. Once the command relationships and tactical missions have been established, both the supported unit commander and the army aviation commander incur individual responsibilities in general terms.

a. The supporting aviation unit commander is responsible to establish timely liaison with the supported unit (except in a general support role); to advise and assist in the preparation of the operation plan, with emphasis on the landing, air movement and loading plans; and to provide technical advice and assistance on such matters as the airlift capabilities of the (supporting unit) and supervision of aircraft loading.

b. The ground force commander is responsible for the preparation of the operation order and supporting plans, the assignment of tactical missions to include supporting aviation units, the physical loading and unloading of unit equipment and such security for the aviation unit as may be required in the forward areas.

2.9 LIAISON. The responsibility to establish and maintain liaison rests with the commander of the supporting aviation unit. However, the speed with which an airmobile operation may be initiated may require that the ground commander establish the essential liaison. (See Table 1.)

a. The aviation liaison officer should be an experienced aviator and a competent navigator, who is well versed on the policies, capabilities and limitations of his aviation unit. The selection of an aviator with the branch qualifications of the supported unit will enhance a mutual understanding.

b. The ground commander will normally be alerted for a pending operation prior to the supporting aviation unit commander. The ground commander should therefore try to identify his supporting aviation unit and establish liaison as quickly as possible. Prompt establishment of liaison will ensure that the ground commander benefits from the professional and technical advice of the aviation commander early in the planning phase.

c. For more specific listing of the duties of the liaison officer, see Appendix VII.

TABLE I. RESPONSIBILITIES UNDER TACTICAL MISSIONS AND COMMAND RELATIONSHIPS

AN AVIATION UNIT ASSIGNED THE TACTICAL MISSION OR COMMAND RELATIONSHIP OF--	RECEIVES TASKS AND RESPONDS DIRECTLY TO--	ESTABLISHES COMMUNICATIONS AND LIAISON WITH--	DISPLACES STAGING AREA (STAGE BASE) WHEN--	COMBAT SERVICE FURNISHED THROUGH--
DIRECT SUPPORT	Headquarters being supported.	Headquarters being supported.	Unit Commander deems necessary or on order of parent unit commander.	Habitual service support channels or as otherwise specified.
GENERAL SUPPORT	Headquarters being supported.	As directed by the headquarters being supported.	Ordered by parent unit commander.	Habitual service support channels or as otherwise specified.
REINFORCING	Headquarters being reinforced.	Reinforced headquarters.	Ordered by parent unit commander or requested by reinforced unit.	Habitual service support channels or as otherwise specified.
ATTACHMENT	Headquarters to which attached.	Headquarters to which attached.	Headquarters to which attached.	Headquarters to which attached unless otherwise specified.
OPERATIONAL CONTROL	Headquarters exercising operational control.	As directed by the headquarters exercising operational control.	Headquarters exercising operational control.	Habitual service support channels or as otherwise specified.

SECTION III

COMMAND AND CONTROL FACILITY

2.10 GENERAL. An airmobile operation, by its very nature, places a strong demand on the commander for flexibility and rapid planning. It involves greater dispersion of forces and extended lines of communication; logistical problems are considerably more complicated; and fire support planning and coordination are rendered more complicated. Yet, the improved command and control facilities simplify overcoming these complexities. The function of command and control can greatly benefit from the advantages of speed and flexibility provided by a command and control (C&C) helicopter.

2.11 EMPLOYMENT OF COMMAND AND CONTROL HELICOPTER. The command and control helicopter provides the commander with an aerial command post from which he and his staff can direct operations to maximum advantage. It is possible to position the command group wherever and whenever their presence is needed. The superior communications facilities together with the improved aerial observation permits the commander, with selected staff representatives, to make necessary decisions as rapidly as the fast, airmobile operation may demand. A key to effective command and control in an airmobile operation is an adequate C&C helicopter. The command and control center for the airmobile operation is the C&C helicopter. The potential value of this aerial command post depends upon the organization of the personnel as well as the adequacy of the physical means for communications and observation.

2.12 ORGANIZATION OF THE C&C HELICOPTER.

a. Selection of the C&C ship. The command and control helicopter is used by the commander, just as he would use any other command vehicle. The utility helicopte[illegible]esirable for battalion level and higher since it will accommodate a five-man command [illegible]nd will provide a greater communications facility than will the LOH. The LOH (OH[illegible]accommodate the commander and two staff officers and is quite satisfactory for use at [illegible]ny level.

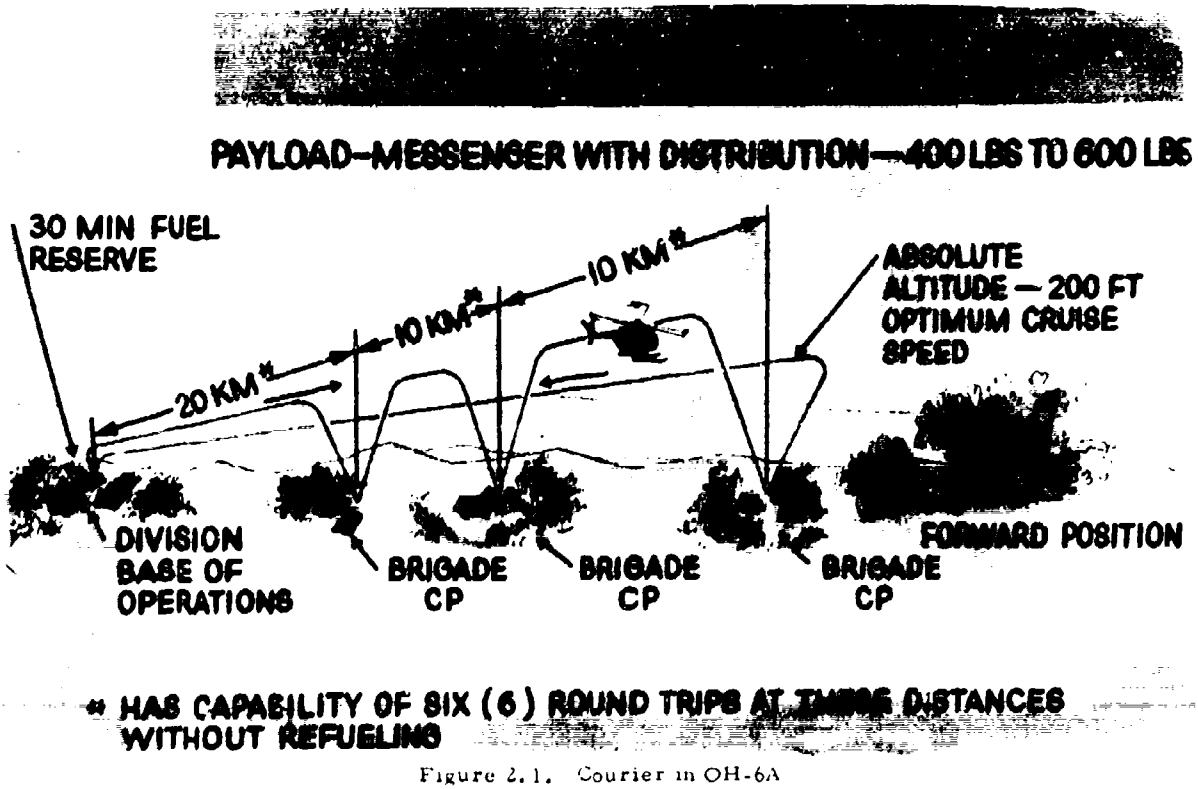


Figure 2.1. Courier in OH-6A

COMMAND AND STAFF TRANSPORTATION

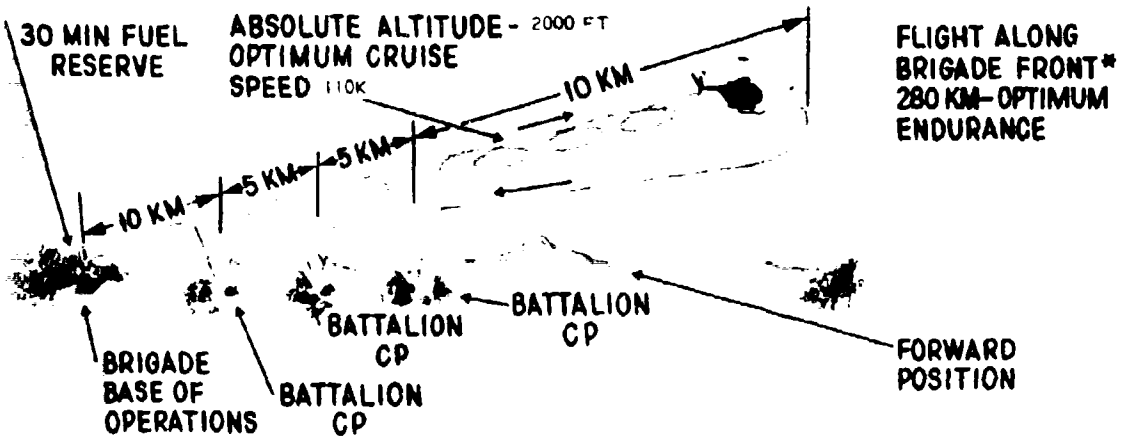


Figure 2.2. Command and Staff Transportation in OH-6A

b. Command Group. The commander may tailor his command group for each mission based on his personal desires.

(1) A command group might include the AMF commander, [illegible] DORD, ALO, and the S2.

(2) The aerial command post may be flown by the supporting aviation unit commander and this will give the AMF commander the capability to coordinate directly on aviation matters and thus make more timely decisions.

(3) Another procedure may be to use the AMF Commander's C&C ship to transport the command group. The aviation commander may pilot a second command and control helicopter to be airborne at all times.

c. Aviator orientation. Optimum value of the C&C helicopter can only be realized if the aviator of the command ship is thoroughly briefed.

(1) At the outset, the pilot must be informed of the mission, flight routes, and altitude, so he can properly plan his flight (map coverage, fuel requirements, SOI extracts).

(2) During the flight, one member of the command post group should be designated to navigate along with the pilot and to keep the pilot informed of the progress of the mission. If the flight is to be over enemy terrain, gunship escort should be requested; the aviator should be informed of areas where enemy fires have been received.

(3) At the completion of the operation the flight crew should be debriefed by a member of the command group.

d. Communications Equipment.

(1) In addition to the organic radio equipment essential for aviation requirements, the C&C helicopter mounts a console capable of accepting a varied assortment of FM, UHF, VHF or HF (SSB) radios for a total of four radios. Each of these four radios (See Appendix III) provide two-way communications and can be operated individually from this console by the command group. The crew of the aircraft can also be tied into this console.

(2) Installation of the console is a field maintenance responsibility and modification of the aircraft to accept this additional communications equipment should be considered semi-permanent and limits the use of the helicopter for other purposes.

(3) An additional FM radio can be adopted for use in the C&C ship by simply laying the AN/PRC 25 set on the floor with the antenna protruding outside.

(4) A more thorough description of the communications equipment is in Appendix III.

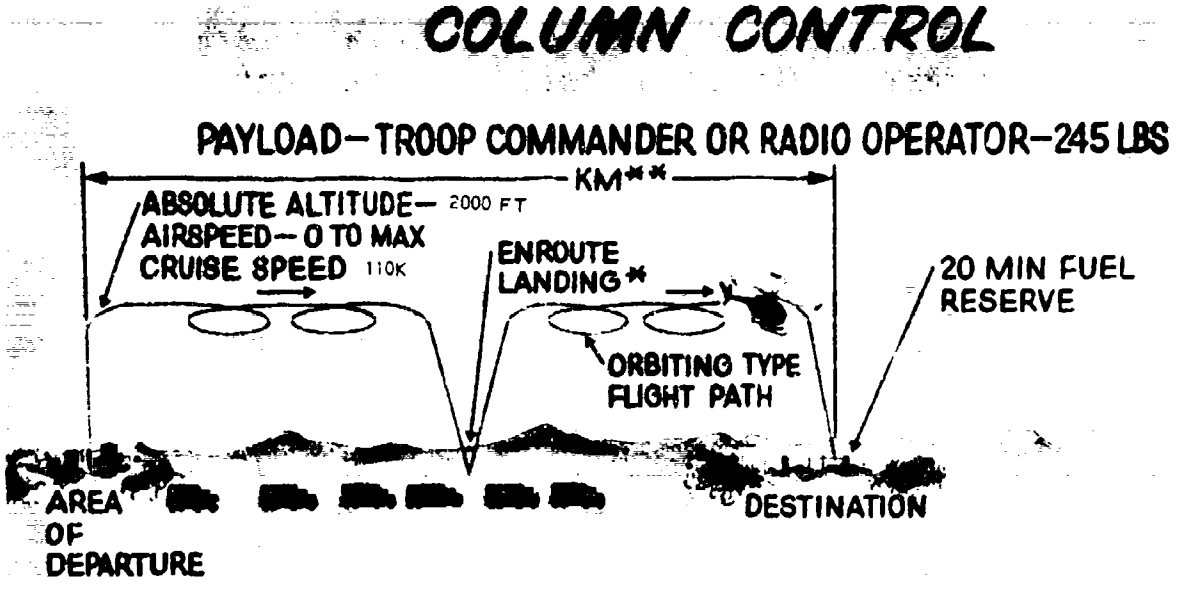


Figure 2.3. Column Control in OH-6A

CONTROL OF MANEUVER ELEMENTS

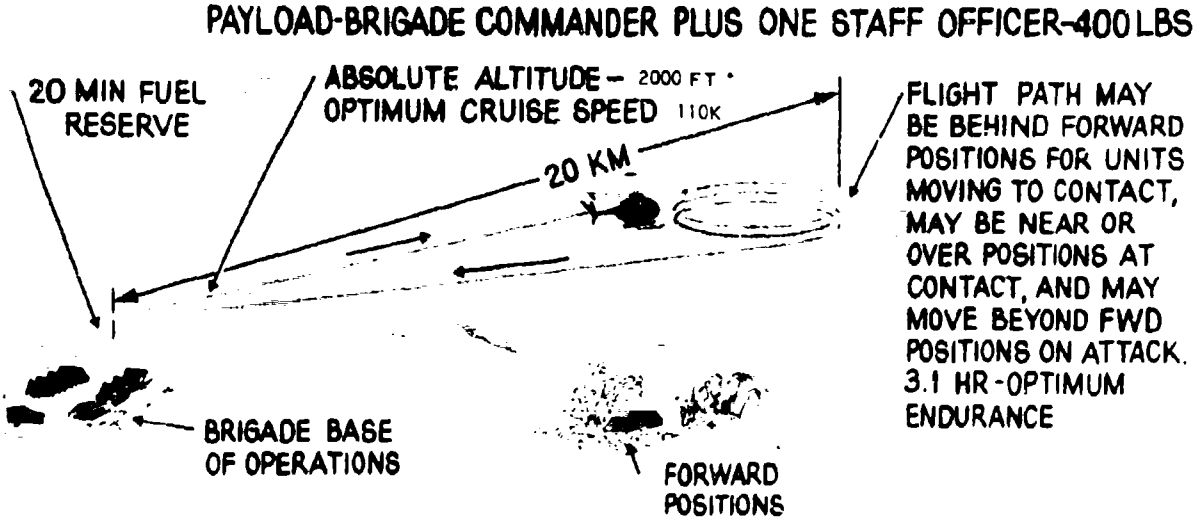


Figure 2.4. Control of Maneuver Elements in OH-6A

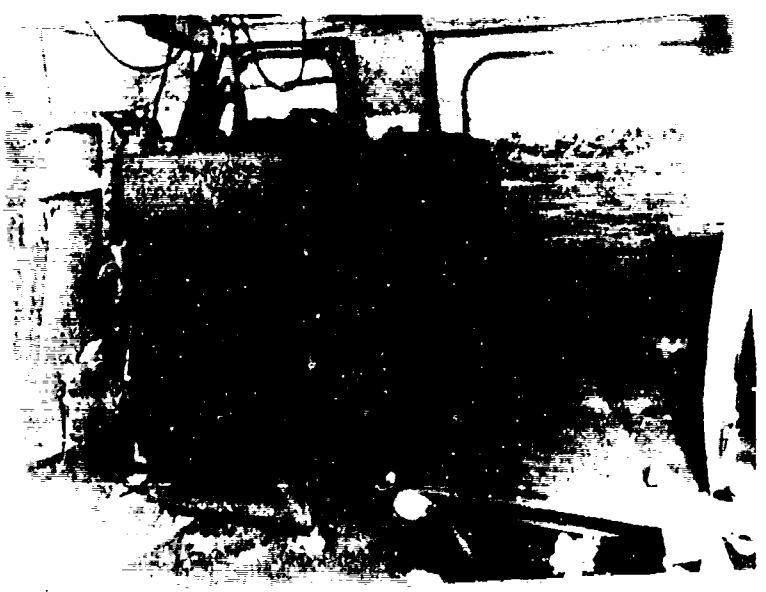


Figure 2.5. Type C&C Arrangement in UH-1B

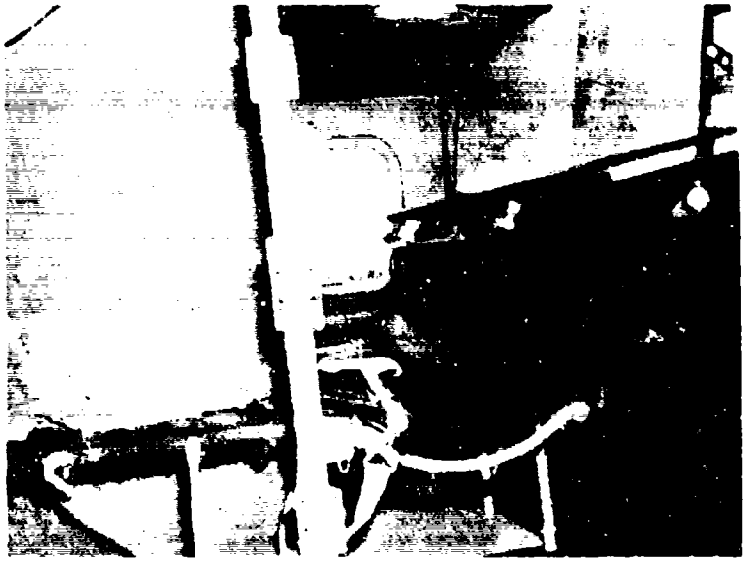


Figure 2.6. Type C&C Arrangement in UH-1D

CHAPTER 3

INTELLIGENCE

3.1 Airmobile forces (AMF), with their increased dispersion and mobility, generate an increased demand for timely and accurate intelligence. AMF's are capable of reacting more swiftly and at greater ranges to enemy threats than any other units included in the Army force structure. The increased tempo of operations demands an equal tempo of information gathering and intelligence processing if commanders are to plan and execute an operation with assurance. This intelligence is a necessary input to command decisions on close air support requirements, maneuver planning, and the selection of landing zones and objectives. Of particular importance is the requirement for detailed information concerning the enemy antiaircraft threat so countermeasures for either avoidance or neutralization of this threat can be initiated. AMF commanders cannot exercise the potential of his unit in the blind. Closely associated with intelligence is the problem of security. Again, the operating techniques peculiar to AMF's have varying impacts upon this aspect of operation. Wider dispersal reduces the susceptibility to enemy nuclear attack, but, conversely, weakens the mutual support, as well as the support which normally is possible from adjacent and higher units. The dependence upon aerial vehicles makes AMF's more sensitive to antiaircraft fires and enemy air. Conversely, the increased mobility of the reserve elements appreciably reduces the size and amount of reserve forces required for security. In providing timely intelligence at greater ranges and over larger areas, the reconnaissance and surveillance means available overcome the disadvantage of dispersion by giving early warning of enemy threats. Army aerial reconnaissance and surveillance means do not supplant Air Force aerial, visual, photographic and sensory reconnaissance support, but are employed to supplement this effort. Timely intelligence is a critical prerequisite in order to fully exploit the capabilities of the airmobile force and to provide the required security.

SECTION II

WEATHER, TERRAIN, AND ENEMY

3.2 ANALYSIS.

a. The mental process of the analysis of the area of operation that is so essential to the intelligence estimate for ground combat operations takes on added emphasis in planning an airmobile operation. The analysis of the area of operations for an airmobile operation must include detailed and continuous study of the effects of the weather, terrain, and enemy.

b. For the purpose of our analysis of weather we will not concern ourselves with good weather because this condition will not adversely affect an airmobile operation unless enemy tactical high performance aircraft are a consideration. Good weather is defined here as ceiling of 2000' or higher, with visibility of 3 miles plus, and no form of precipitation or fog forecast.

3.3 WEATHER. In analyzing the weather, the AMF S2 and the aviation unit S2 consider existing and forecast conditions to determine the effects weather will have on the airmobile operation. Only under the most severe weather conditions, will airmobile operations be cancelled. During the planning and execution phases, however, adverse weather may cause delays or modification of selected pickup zones, altitudes, formations, flight routes, alternate flight routes, escort plans, landing zones and fire support plans. Weather minimums must be established early in the planning phase to prescribe the acceptable conditions that the AMF commander will accept to mount the operation. To establish the minimum the AMF S2 working together with the aviation S2 considers atmospheric conditions, wind, visibility, clouds, and precipitation. These elements influence airmobile operations to the extent that they affect the airmobile force in the normal areas of visibility, trafficability, men and equipment. Weather analysis for an airmobile operation must be timely and continuous, and remains valid only so long as weather conditions and forecasts remain constant.

a. Visibility.

(1) Visibility is a factor only when it is restrictive to helicopter operations - visibility of 1/2 mile or less is restrictive. Helicopters can operate with less than 1/2 mile visibility--provided the operation has been well planned, and sound judgment and caution are used, and well trained flight crews are flying the mission. Restricted visibility makes navigation more difficult, reduces the agility of the formation (the larger the formation the greater this effect), and increases the possibility of mid-air or obstacle collisions. When visibility is below 1/2 mile, the AMF commander should consult the aviation commander for his recommendations to delay or cancel the operation. The aviation commander will consider the terrain to be overflown, density of air traffic, and state of proficiency of the flight crews before he gives his recommendations. The AMF commander, based on this recommendation and the urgency of the mission, can then make the final decision.

(2) Visibility is affected by fog, precipitation, clouds, and/or smoke. (Figures 3.1 and 3.2.) Conditions of restricted visibility normally will favor the AMF by affording concealment from enemy air and long range ground observation, thus reducing the effectiveness of observed fires. This condition also constricts an airmobile operation by limiting the use of supporting air and observed fires. Restrictive visibility may be turned into an advantage for the airmobile force provided proper detailed planning has taken place. To conduct airmobile operations under restricted conditions of visibility the AMF commander must accomplish the following during planning:

(a) Command Reconnaissance. Success under restrictive visibility lies in proper command reconnaissance techniques and flight route selection. The flight route to the landing zone (LZ) should be reconnoitered, unless doing so would violate pre-operational security requirements. The flight route control features must be easily identifiable from both altitudes, and the flight route strictly adhered to, particularly if multiple routes and sorties are required.

(b) Weather Flight Check. Under restrictive weather conditions an inflight check of the route and LZ should be accomplished to determine the feasibility "to go". Ideally, this weather check should be accomplished prior to the start of the preparation of the LZ and certainly in time to hold the AMF on the pick-up zone (PZ) to prevent departure into weather conditions that may cause an abort of the mission. The check can be accomplished by the command and control (C&C) helicopter or the aviation commander.

Figure 3.1. Fog Obscured LZ. Note Darkened Condition caused by Artillery Preparation.

(c) Fire Support. Air corridors enclose the flight route from loading area to landing zone, with fire support planned where needed. Fires, especially napalm and WP, should not be placed directly on the LZ, when visibility is marginal.

(d) Air Traffic Control. All aircraft in the objective area must be controlled on a common frequency and only necessary aircraft allowed into the area.

(e) Night Fall. When the operation is to be conducted under marginal weather conditions with a chance that End Evening Nautical Twilight (EENT) will occur before completion of the operation, command consideration must be given to the urgency of executing the operation. Marginal weather coupled with darkness presents a condition that is tactically unsound for airmobile operations.

Figure 3.2. Same LZ after fog and smoke cleared.

(3) Special Hazards of Visibility. Dust (Figure 3.3) and snow are major hazards to terminal operations, but can be safely overcome by planning. (These hazards can exist in the PZ as well as the LZ.)

(a) Blowing, deep snow will act the same as tall grass and dust by obscuring the touchdown site, and create instrument flight conditions. If the snow is packed a hover approach may be executed, but if it is loose snow an approach to the ground will have to be executed provided the depth is known. Blowing snow will also have an effect on the size of the formations capable of using the same PZ/LZ at one time. Aircraft should be dispersed at least twice normal separation prior to landing. Hazardous conditions will also exist for troop movement in and around the helicopters and may negate the lifting of sling loads, particularly with the medium helicopter.

(b) The discussion of snow is applicable to dusty, dry, and sandy PZ's/LZ's. Dust clouds will rise to great heights (Figure 3.4) and earmark the PZ/LZ in use as well as create extremely hazardous flight conditions. The real defense against a dusty PZ/LZ is prior knowledge of this condition and proper flight separation into the LZ. Mass landings (eight or more helicopters) should not even be considered unless the PZ/LZ is of unlimited size and clear of obstacles.

b. Trafficability. Weather effects are considered from the standpoint of the capability of the soil in the PZ/LZ to support the weight of the helicopters.

(1) Excessive water or mud will obscure the touch down site and may mire the skids preventing departure of the helicopter. This may be overcome by keeping the helicopter light on the skids or terminating at a hover (one to three feet) and letting the troops jump out.

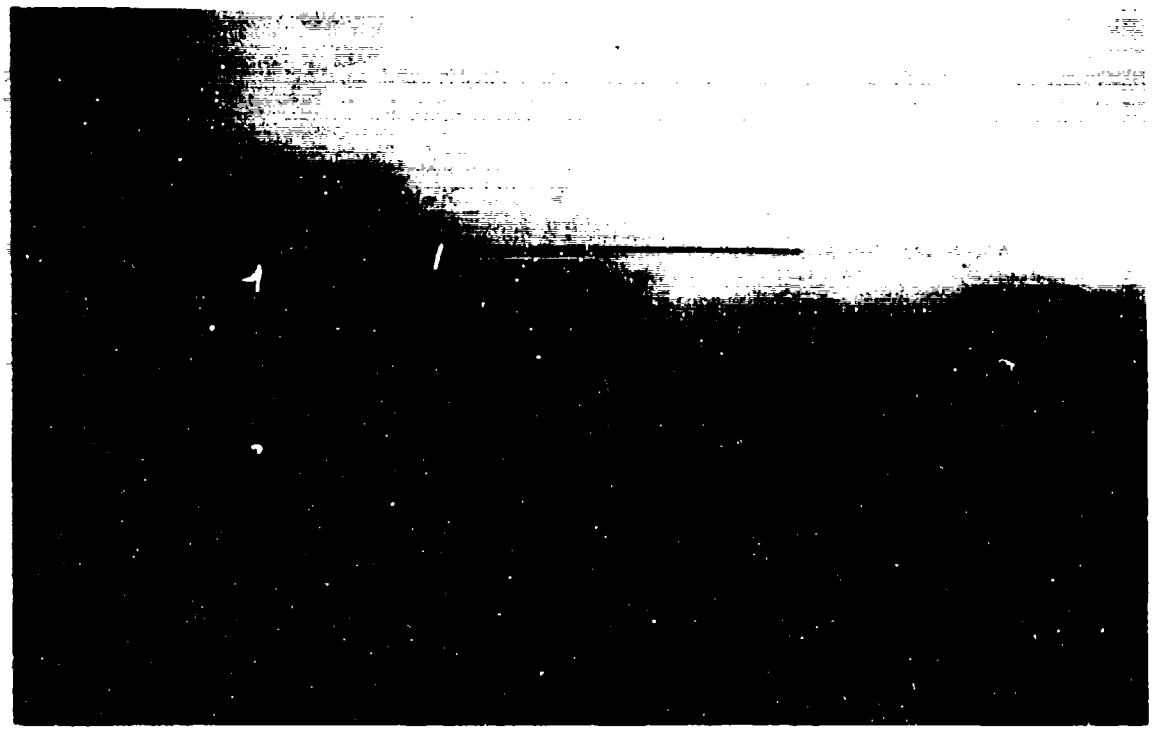


Figure 3.3 Visibility Restricted by Dust.

Figure 3.4. Dust Clouds up to 200 Feet.

(2) The height of tall grass or depth of snow, etc , must be known to prevent damage from hidden obstacles. If this information is not known then a touch down landing should not be used and the troops will be required to exit from a hover.

(3) The ground commander must insure that the S2's analysis of trafficability considers the mobility of the enemy force as it affects their ability to react to the landing. Approach routes into the LZ must be covered by preparatory fires with planned fires along the routes for immediate responsiveness. The airmobile force is most vulnerable during landing. Only through proper analysis of the enemy's ability to react coupled with good fire support planning can the AMF commander gain the time he needs to properly secure the LZ and move to his objective.

(4) Employment of vehicles will be limited and not a major factor in airmobile operations. Artillery and similar supporting weapons and heavy equipment can be positioned by sling load on the exact firing location and need of prime movers is reduced.

c. Men and Equipment. The effects of weather on men and equipment is identical to the effect in ground operations, with the exception that troops are spared the arduous move to the objective by using helicopter.

d. Atmospheric Conditions. A major factor that determines troop allowable cargo load (ACL) is a combination of atmospheric conditions and terrain factors. The sum total of these factors; temperature, barometric pressure, density of the air, and altitude (elevation of the LZ/PZ); is referred to as density altitude (DA). The consideration of DA is an aviation planning responsibility. However, the ground commander must understand that extremes in these areas will effect the troop/cargo lift capabilities, and make early coordination with the aviation commander necessary to determine the allowable cargo load (ACL). What this represents, to the commander, is that as temperature and altitude of the PZ/LZ increases he will have a decreased lift capability per helicopter and will require more aircraft for a given mission.

e. Wind direction and velocity are frequently factors which will affect airmobile operations, especially influencing the approach path into the PZ/LZ. This is important for the ground commander to know so the troops can be briefed on landing direction in relation to the objective. Any changes in the planned landing direction must be given to the troop commander aboard each helicopter by the aircraft commander to insure orientation upon landing. An aircraft taking off or landing into the wind requires less forward motion over the ground than with a no-wind condition. A head wind will increase the lift capability of an aircraft to a certain extent. A down wind condition (taking off or landing with the wind) has exactly the opposite effect of a head wind. Larger areas are required for take-off and landing and lift capability is reduced. Wind is a factor when it exceeds 8 knots (5 miles per hour) and must be considered to plan take-offs and landings into the wind. If it is not possible to do so, then loads should be reduced accordingly or relocate the LZ. Wind will also affect time enroute, and if timing is critical, adjustments in take-off time and in airspeeds, as well as fuel loads, will have to be made to compensate for wind.

3.4 TERRAIN. The elimination of terrain constraints is a distinct advantage available to only airmobile forces and allows the commander unequalled freedom of maneuver. Terrain still must be analyzed in terms of observation and fire, concealment and cover, obstacles, key terrain, and avenues of approach to determine the courses of action available to the AMF and enemy forces. The five military aspects take on a different perspective during the airmobile planning phase of the operation.

a. Observation and Fire. The AMF S2 identifies those terrain features within and adjacent to the objective area as is normally done, but he must extend his analysis to cover flight routes over terrain which afford the enemy the least favorable observation and fire. The analysis of observation and fire will be a governing consideration for determining flight altitude and flight routes.

b. Concealment and Cover.

(1) A degree of concealment is provided an AMF by selecting flight routes over dense forests, heavy jungle canopy, and other features which restrict ground to air observation. Concealment from observation of enemy air forces can be accomplished only by nap-of-the-earth flight techniques and aircraft camouflage.

(2) Cover may be provided by nap-of-the-earth flight techniques to take maximum advantage of heavy foliage, high terrain that masks the flight routes and folds in the ground between which the airmobile column can fly.

c. Obstacles. Only obstacles to take-off and landing in the vicinity of PZ's and LZ's are considered by the AMF. Obstacles enroute to the objective are overflown with ease and do not require consideration by the analyst except for downed aircraft sites. The AMF S2 must however, carefully consider any obstacle that may lie between the LZ and the objective and the time required to overcome the obstacle to reach the objective.

d. Key Terrain. Key terrain is considered in selection of the flight route for the airmobile force. Terrain that falls under this classification should be avoided as these areas will normally be heavily defended to include air defense weapons. The air control points selected along the flight route are not to be considered as key terrain - and should not be key terrain. By their very nature PZ's/LZ's are key terrain.

e. Avenues of Approach. The avenues of approach for an airmobile operation are the flight routes and flight corridors into and out of the objective area. A flight route or air avenue of approach is a route which provides a suitable flight path for the AMF to reach the selected LZ's. Factors to be considered in selecting flight routes are relative ease of navigation, avoidance of known enemy locations, concealment from enemy observation and weather restrictions. Flight routes may be a specified path over the terrain or may be described by use of a simple checkpoint system to allow off-course flight techniques and flexibility for in-flight changes. Major road nets should be avoided as the possibility of drawing fire is magnified by over-flying roads.

f. The limited discussion here of the tactical aspects of the area in no way implies that this is all the AMF S2 must take into account in his airmobile planning. The fact is, this is in addition to his normal analysis required to conduct operations once reduced to ground mobility in the objective area. The aviation unit S2 can be of valuable assistance to the AMF S2.

3.5 ENEMY. The ultimate goal in airmobile operations is to land the attacking force on the objective. This is not always possible due to terrain restrictions, in which case the assaulting force is landed as close to the objective as possible. It would be foolish to stop here and leave the false impression that terrain is the key factor to landing on or near the objective - because while it is a governing factor, the planner of an airmobile operation must consider all data available on the enemy before the final selection of an LZ on the objective. An attempt should not be made to land on a heavily defended objective area unless the commander is willing to accept heavy losses to take the objective.

a. Disposition. The known disposition of the enemy is vital to selection of the most secure LZ's and flight routes and fire support planning. The known or suspected enemy disposition both enroute and in the objective area should be used to determine the degree of enroute and LZ preparation, and not establish a "standard" time frame for each operation. Do not establish a fire support pattern.

b. Composition. Composition of the enemy will disclose the fire power present, in particular the air defense weapons, tactical air, armor and air cavalry, and airmobility to include armed helicopter capabilities.

c. Strength. The determination of committed forces, reinforcement, air and CBR capabilities is very vital to the AMF commander.

(1) Committed forces will determine the feasibility of LZ selection in proximity of the objective. The degree of logistical support required to accompany the assault echelon will also hinge on the strength of the committed forces in the area.

(2) Enemy reinforcements will determine the requirements for rapid build-up in one LZ or the use of multiple LZ's to divide the efforts of the reinforcing force.

(3) If the AMF commander does not have air superiority, the planning of the operation will have to be in greater detail, and conducted on nap-of-the-earth level to enhance success, or in extreme cases, cancel the operation. Possibility of air attacks will also dictate the use of wider dispersed PZ's to limit engagement of the airmobile force before it leaves friendly lines.

d. CBR. An enemy with a CBR capability actually has less advantage over an airmobile force because of the speed and flexibility inherent in helicopter employment as long as the AMF is prepared to counter this threat.

e. The knowledge of the enemy plays a major role in the decision of helicopter employment. By rapid reaction to timely intelligence an airmobile force can orient on the enemy and not restrict operations to terrain objectives.

f. Airmobile units, with their increased dispersion and mobility, generate a particularly large requirement for timely and accurate intelligence. Army aerial reconnaissance and surveillance are among the most productive sources of immediate intelligence available to the AMF com nander.

SECTION II

AERIAL RECONNAISSANCE AND SURVEILLANCE

The aerial reconnaissance, surveillance, and target acquisition (RSTA) efforts of Army aviation are directed toward intelligence efforts within the division area of responsibility on missions that require immediate and specific response by the ground commanders. The resources of other Services are required and will be utilized for requirements forward of the division area of responsibility.

Figure 3.5. Aerial RSTA within Division Area of Responsibility

SECTION II

AERIAL RECONNAISSANCE AND SURVEILLANCE

3.7 AERIAL OBSERVATION MISSIONS.

a. Aerial observation missions are accomplished by employing aerial visual techniques to obtain and report information of intelligence value. These techniques are divided into four areas: visual search, target recognition, geographical orientation, and general target location. (See Aerial Target Acquisition Section III.)

b. To capitalize on daily aerial observation by flight crews a de-briefing program must be established by all units with organic or supporting aviation in addition to the activities by the aviation unit. (See Appendix IV, Type Mission Debriefing Checklist.)

3.8 ELECTRONIC AERIAL RECONNAISSANCE AND SURVEILLANCE MEANS. The performance of electronic aerial reconnaissance and surveillance is restrictive in that limited Army aviation agencies can be employed in this capacity. Primarily the performance of these missions is limited to sophisticated OV-1 Mohawks.

3.9 MISSIONS FOR ELECTRONICALLY EQUIPPED AIRCRAFT. The mission of Army aircraft equipped with electronic sensors and devices is to monitor the assigned sector of the battlefield to gain intelligence information. Highly effective aerial reconnaissance and surveillance can be conducted both day and night under all weather conditions by selection of the appropriate sensors and devices. Aerial electronic reconnaissance and surveillance is an additional means to extend and supplement ground reconnaissance, and should be utilized in conjunction with ground reconnaissance when possible.

3.10 AERIAL RECONNAISSANCE AND SURVEILLANCE ELECTRONIC EQUIPMENT. The sensors used for both type operations are the same. The Army presently has in use three means of electronically surveying the battlefield: Photographic, radar, and infrared equipment.

3.11 EMPLOYMENT TECHNIQUES. All Army aircraft can be utilized on aerial reconnaissance and surveillance missions. The commander must realize however, that aerial reconnaissance is not an end in itself and should always be complemented by a ground reconnaissance means when the situation and time permit. The use of organic Army aviation will give the ground commander an immediate means to conduct aerial observation with the capability of immediate dissemination of acquired information.

a. The tactical unit integrity of the reconnaissance element is normally retained. If the aircraft are fragmented and employed separately it is much like fragmenting an armor or artillery unit to employ single tanks or a single tube of artillery. Special equipped aerial reconnaissance and surveillance aircraft are employed by the aviation commander based on mission requests. These aircraft are normally employed so they can be mutually supporting, and are not employed singly unless covered by another type of aircraft or by ground troops.

b. Team flying techniques are quite important. By reconnoitering with teams of aircraft it is possible to cover larger areas more quickly and thoroughly. Putting different types of aircraft on the same reconnaissance mission is also effective. For example, an O-1 aircraft may be teamed with two armed UH-1B's. The O-1 can fly high aerial reconnaissance and at the same time cover the UH-1B's performing detailed low level reconnaissance by fire. If the UH-1B's make a sighting or flush the enemy, the O-1 can keep track of the target while the UH-1B's are turning for a better look or to engage the target.

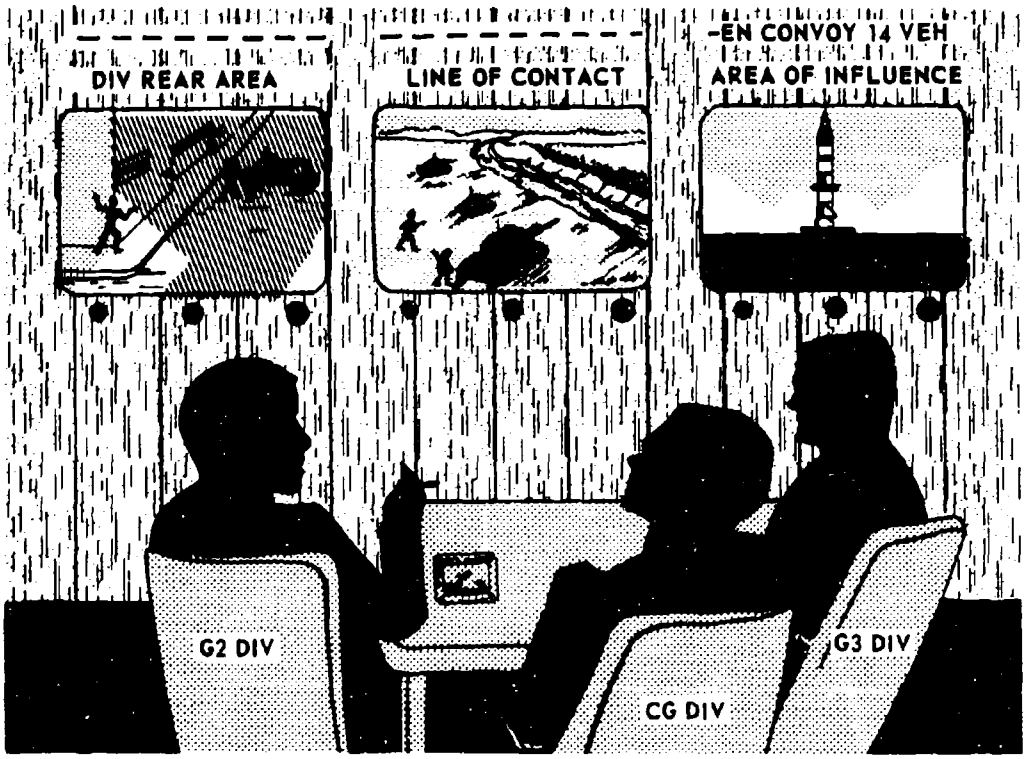


Figure 3.6. Ultimate in Combat Surveillance.

c. For ease and efficiency of operation, an area may be divided into geographic areas which can be thoroughly covered in two hours of flying. (Normal fuel time for OV-1's, though the use of drop tanks extends this to 4 1/2 hours.) These areas are numbered and/or lettered for identification purposes. The same aviator and observer fly in the same area on a daily basis so that they become intimately familiar with the area and are able to detect any deviation from the normal. Missions should not, however, establish detectable patterns. The time of day and direction of flight should be varied to prevent the enemy from ceasing activity during these times and moving only at times when aircraft are known not to fly over the area. Unfortunately, this is not always possible. For example, some targets, especially those hidden in tree lines, require the sun to be at a low angle in order to see under the trees. It is not possible to greatly vary observation times for these targets and areas.

d. It is not important to have 100% coverage of areas on a daily basis. For example, the crest and upper slopes of high mountain ranges are too inaccessible for daily use. Coverage of these areas on a weekly basis is probably sufficient. Deep jungle with heavy canopy cover cannot be penetrated by visual methods and only requires routine aerial coverage.

e. Missions should be planned to cover lower mountain slopes, sources of water supply, village complexes, and man made features such as bridges on a daily basis.

f. The enemy, like friendly troops and because of the need for speed, prefers to use trails, roads, the ocean, rivers and streams to move from one place to another. When they do move cross-country they prefer to cross terrain that is easily trafficable such as valleys and dry river beds. Coverage of these areas should be weighed toward known areas of enemy concentrations, lines of communications, and areas where terrain favors enemy use.

g. Reconnaissance by fire may be used when the vegetation growth is such that aerial observation is obscured. During the conduct of the mission the flight crew must be continually observing to detect enemy fire to be able to pin point the enemy location and return fire. This technique will usually result in the loss of any surprise, but it will tend to develop enemy positions in areas that may be by-passed otherwise. If the pattern of recon by fire is varied then it will be possible on certain occasions to achieve a degree of surprise.

(1) When fire is returned the flight leader will immediately report to the supporting unit commander and attempt to develop the situation.

(2) If fire is not returned then the mission is continued as planned. Caution should be taken by the ground commander when moving into an area reconned in this manner as this technique will not always be effective against well seasoned troops.

(3) When this technique is utilized and deemed necessary by the ground commander, it is highly desirable that he have an airmobile force ready for immediate employment to further develop the situation or to aid downed aircraft crews.

h. The supported and supporting unit S2's should keep a targeting book on all sightings. This should include, but need not be limited to: times and dates of sightings, target description, required diagrams, and should be plotted on a map to facilitate briefing. Attempts should be made to reduce sightings to targets by planning additional missions to develop these sightings.

i. The OV-1B with its Side Looking Airborne Radar (SLAR) permits surveillance deep into enemy territory. In a conventional war, the aircraft is normally flown on a flight route parallel to and over friendly lines because of its capabilities to be employed at high altitude and at a slant range. In an environment such as Vietnam this technique does not apply. There the OV-1B is employed to overfly suspected enemy areas.

j. The OV-1C is employed on day or night missions with tactics and techniques adapted to the type mission being flown. Infrared (IR) is particularly effective at night and for surveillance of camouflaged or concealed positions. IR is often employed in conjunction with visual or SLAR missions to obtain additional information on activities noted by the visual or SLAR aircraft.

3.12 REPORTING PROCEDURES.

a. All aerial reconnaissance and surveillance, to be effective, must be timely and the user must have the ability to react to reported sightings. Aviators and observers must be completely familiar with the exact location and designation of all friendly troops to include exact locations and ranges of all artillery units, close air support aircraft, and naval ships. They must know unit call signs and frequencies, rules of engagement, how to spot and mark targets for close air support aircraft, and what units are responsible for the area in which they are flying.

b. All aircraft crews, including those engaged in combat and administrative flights, must know how to enter appropriate radio nets to make spot reports to the ground units in whose area they are operating. If such reporting channels do not exist, the aviation unit responsible for the area will establish provisions for reporting spot intelligence information.

c. Some information may be of the type that should be passed immediately into aviation intelligence channels of aviation units located in the same or adjacent areas as well as to supported units. The decision on which channel to use is made by the supported unit S2.

d. All users of aviation as well as the flight crews must remain constantly aware of the fact that every flight may produce information that can be converted into intelligence. For this reason, all personnel must be instructed to be alert and, when not engaged in combat or other actions necessary to mission accomplishment, to actively perform aerial observation of the operational area.

e. In order to gain the maximum results, both supporting and supported S2's should establish an orders and request file. This file will be checked by flight crews prior to each flight and by unit S2's prior to each briefing. This file will include the frequencies and call signs of the local spot report intelligence nets. All aviators and crew members should receive an intelligence briefing and debriefing, to include the flight crew of the C&C helicopter.

f. Aviation operations personnel are trained to pass intelligence information to appropriate agencies so that if no other communication nets are available, flight crews will use pathfinder personnel, control tower, or flight following frequencies to pass intelligence information. Intelligence information messages relayed through these agencies should be preceded by a code word to insure that they are recognized as intelligence messages.

3.13 AERIAL SECURITY MISSIONS. Aerial security complements aerial reconnaissance. Therefore, Army aviation provides aerial security by early detection of an enemy threat in time to allow the friendly force to deploy during the conduct of all aerial reconnaissance and surveillance missions. Armed helicopters employed on an aerial security mission are capable of limited delay and even forcing early commitment of the attacking force. Aerial security missions assigned Army aircraft should be designed to complement the functions of the supported units covering force, advance guard, screening force, and rear area security force. It is within the capability of all units to conduct reconnaissance and security missions, but to do so will result in a division of combat power. The same is true of Army aviation units - all aircraft can be utilized in an aerial reconnaissance and security role but at the expense of limiting utilization in other areas, except for specially designed aerial reconnaissance and surveillance aircraft. The air cavalry troop is organized specifically to perform aerial reconnaissance and security missions. The air cavalry troop, then, is the primary unit with organic aviation to perform aerial security. In an airmobile environment, where ground reconnaissance and security efforts of the squadron are often limited, the troop may be employed in support of other units; this is however, the least desirable method of utilization. FM 17-36 covers the proper employment techniques for the air cavalry troop.

SECTION III

AERIAL TARGET ACQUISITION

3.14 GENERAL. Aerial target acquisition, although often used at brigade and battalion levels synonymously with aerial reconnaissance and surveillance is not synonymous and is a distinct function in itself. Aerial target acquisition missions are assigned to develop information collected by aerial reconnaissance or surveillance missions. The airmobile force's search for targets is not for engagement by fire support means alone. The force is capable of deploying combat elements against fleeting targets that, heretofore, could only be engaged with any degree of effectiveness by long-range artillery or air attack.

3.15 AERIAL TARGET ACQUISITION MISSIONS. All Army aircraft can perform aerial target acquisition, however, this function is best accomplished by armed helicopters with an effective weapons system to fix the target once located. Electronically equipped OV-1's capable of vectoring in armed helicopters or close air support are highly effective in this role. Army aircraft effectively augment DivArty's target acquisition capabilities by employment of both OV-1 and armed helicopters.

3.16 AERIAL OBSERVATION. Army aircraft on planned aerial observation missions have the capability of aerial target acquisition by bringing fire support means to bear on the target.

a. The purpose of visual search is to detect targets. It is influenced by the altitude of observation, speed of the observation aircraft, terrain conditions, and limitations of the human eye.

b. Target recognition or identification of sighted targets assists commanders, and especially their intelligence officers, in associating items of equipment with specific types of enemy units. For example, if an aerial observer reports an indirect fire weapon as a mortar, but does not indicate the size, then the usefulness of the information is restricted. If the observer had identified the weapon as a heavy mortar, it would have provided more validity in estimating the size or type unit.

c. Geographical orientation and target location complement each other. Geographical orientation is the ability of an aircraft crew to know its position relative to any geographic reference including tactical maps, charts, airphotos, or pre-selected terrain feature(s). Target location is the transdisposition of a sighted target on the ground to a geographical representation of the terrain, such as a map or chart.

d. Once the target or enemy activity has been detected, identified, and located, it must then be reported to the person or agency requesting the mission. The crew makes immediate reports to the supported requesting agency. If an immediate report is not required while the aircraft is in the air, the debriefing officer forwards a mission report through intelligence channels to the unit(s) concerned.

e. The trained aerial observer is the most important crew member to aerial target acquisition. The supported unit will normally provide the aerial observer, therefore, aerial observer training should be conducted by all users of Army aviation. For detailed information on aerial observer training techniques, see FM 1-80.

CHAPTER 4

COMBAT SERVICE SUPPORT

Aerial vehicles, in the support role, increase tactical mobility by reducing the load carried by the maneuver elements. For sustained operations, airmobile forces require a support system with a mobility equal to that of the tactical force. Combat support and combat service support are controlled by the AMF commander. Airmobile forces require a complete Air Line of Communication (ALOC) for combat service support, whereas less mobile forces require only supplemental airlift support. Sustaining airmobile forces requires maximum use of Army aircraft. Supply and services are tailored to operational and maintenance requirements. Supply levels are kept to an absolute minimum. Mission-essential items are pooled at appropriate echelons to provide back-up support without the necessity for dispersing burdensome quantities of supplies in forward areas. The basic concept of rsuplly is to by-pass intermediate echelons wherever feasible. Through-put distribution is the term used to describe this concept. The overriding consideration is the capability of the user to handle, store, redistribute, or utilize the supplies delivered.

SECTION I

FUNDAMENTALS OF AIRMOBILE LOGISTICS

4.1 INTRODUCTION. The major difference between logistical support of airmobile forces and that of less mobile forces is that primary reliance is placed on an Air Line of Communication (ALOC) for combat support and combat service support whereas ground mobile forces rely on ground lines of communication (GLOC). An airmobile force uses all available aircraft to enhance combat support and combat service support whereas other forces normally require only supplemental airlift support of the GLOC.

4.2 FUNDAMENTALS. Airmobile logistical operations are governed by the basic fundamentals of logistics. These fundamentals are changed in as much as they are airmobile oriented and related to the requirements generated by the use of aircraft in a logistical role.

a. Maximum Use of GLOC's. The AMF should use available GLOC's to the maximum to preclude requirements for excessive numbers of aircraft in a combat service role. In Vietnam GLOC's rarely exist down to committed battalions, but are normally available within base camps areas and between base camps and the supporting logistical depot.

b. By-passing Echelons. Intermediate support echelons are overflown or by-passed when feasible during airmobile operations. When supplies are airlanded at forward logistical bases by fixed wing aircraft, the supplies will be broken down at the forward logistical base and airlifted directly to the user. Overflying or by-passing of intermediate echelons reduces the number of helicopters used, simplifies aircraft scheduling in lower units, and consequently releases more aircraft for other combat missions. Additionally the reduced handling releases more troops for other missions, decreases the probability of damaged items and expedites delivery of needed supplies. Delivery of supplies directly to the user is influenced by:

(1) The capability to handle, store, redistribute, or use the supplies. Supplies should be organized in loads tailored to meet requirements. (See Appendix VI SOP).

(2) Available landing zones, adverse weather and enemy situation in the receiving unit's area may require delivery means other than air landing.

c. Minimum Supply Level. The stockage maintained at each echelon depends upon the responsiveness of the resupply system. Mission essential items are pooled at appropriate echelons to provide back-up support without dispersing burdensome quantities of supplies in forward areas.

(1) Because airmobile operations are fluid in nature, logistical bases must be responsive to changes and able to move with little advance notice. All S4's must stay abreast of changes in the location of customers, as well as the tactical situation.

(2) The airmobile force maintains a limited stock of reserve supplies. Therefore, supplies must be stocked in sufficient quantities in an area close enough to permit rapid flow to the requesting unit, yet allow rapid breakdown and movement of logistical bases to support changing tactical situations. Keeping supply levels to a minimum at forward logistical bases also avoids stockpiling supplies that other units may need.

d. Tailored Supply and Services. The supplies and services required for each operation are anlyzed in detail. The logistical support needed for a particular operation varies with the terrain, enemy situation, type of operation, quantity of personnel and equipment involved, and experience factors from previous operations; however, logistical support of an airmobile

operation is further dependent upon availability of supporting aviation. This fundamental is not unique to airmobile operations. The important factor is to establish liaison promptly with supporting aviation, and to realize that all available aircraft can not be committed all the time to combat assault missions -- logistical aircraft must come from the total resources. Pallet or preassembled loads using A-22 containers or cargo nets are used to maximize tailored supplies. These loads, prepared as external loads whenever possible, provide ease of handling and distribution. Techniques for preparing pallet loads include:

(1) Breakdown in small mixed loads by class of supply, to meet the demands of the user. The proper size and mix of loads requires detailed planning by S4's.

(2) Loads prepared so that they can be carried by either utility or medium cargo helicopters. When medium helicopters are used pallets can be rigged together as one sling load.

(3) Marking pallets by contents and storing accessible to the helipad to expedite loading.

e. High Risk Area Utilization. Utility helicopters are used for supply and evacuation missions in high risk areas because they:

(1) Are more maneuverable.

(2) Require smaller and less preparation of landing sites. (Most supplies moved from a brigade logistical base to user are lifted by utility helicopters for this reason.)

(3) Incur less total loss should the helicopter go down.

f. Forward Repair or Evacuation. This fundamental is applied in airmobile operations as it is in all other operations, to include on site repair of aircraft or evacuation.

g. Continuous and Comprehensive Planning. Logistical planning must be continuous and comprehensive if the right support is to be at the right place at the proper time. Since the demand for helicopters is high during airmobile operations, aircraft requirements must be planned in advance to move supplies and services in consonance with unit needs. Alternate plans must be made for contingencies related to the changing nature and tempo of airmobile operations.

h. Support Forecast. In order for a unit to have adequate support, extensive planning and accurate forecasting of requirements must be accomplished on a daily basis and as the tactical situation changes. Unit S4's must be aware of the tactical plans of their units and stay abreast of the tactical situation. Whenever possible a responsible S3 representative should accompany the supplies to the requesting unit on the lifting aircraft.

SECTION II

COMBAT SERVICE SUPPORT UNITS

4.3 ORGANIZATIONAL MODIFICATIONS IN THE AIRMOBILE ENVIRONMENT. To keep pace with requirements and demands placed upon combat service support units in airmobile operations and to maintain an ALOC, supply and service units will require internal modifications to accomplish their support missions efficiently. Logistical installations will of necessity undergo changes to support aviation transportation requirements. Supply and service procedures will have to be geared to the speed and dispersion common to airmobile operations. All combat service support units are capable of organizational changes to cope with internal modifications, changes in logistical installations, and improving supply and service procedures when supported by Army and USAF aircraft.

4.4 UNIT BASE CAMPS.

a. Unit base camps, common to division or separate brigade size units, will contain all combat service support units not directly committed in the forward logistical bases. Combat and combat support units not engaged in operations within the Tactical Area of Operations (TAOR) are also located here, along with the rear echelons of committed units.

b. To be completely functional for supply and service operations this base camp should meet certain requirements when reliance is placed upon an ALOC.

(1) The unit base camp must be in close proximity to an airfield that can be used for landing supplies and equipment by Air Force and Army aircraft.

(2) The main purpose of the unit base camp should be oriented to provide facilities and services which can not be furnished in the forward logistical bases. Large quantities of supplies are stocked here, such as the unit's reserve of supplies. When through-put delivery by Army sources cannot be accomplished, shipments are made to the unit base camp where the supplies are unloaded, temporarily stored, and prepared for delivery to users by helicopters or trucks, depending on the situation.

(3) Its precise location is contingent on tactical plans, terrain, and security considerations. Units in the support areas of the base camp are moved as frequently as necessary to maintain continuous combat service support.

4.5 FORWARD LOGISTICAL BASES.

a. When deployed from the base camp battalion and larger units will habitually establish forward logistical bases. The level of the unit and the scale of the operation will govern the physical size of forward logistical bases. Aviation requirements will also be considered when establishing each forward logistical base.

b. Brigade Logistical Bases.

(1) Each committed brigade establishes a forward logistical base which contains installations and facilitates to provide combat service support to supported units. This forward logistical base may be within the base camp, combined with a division or another brigade, but is normally a separate installation. Logistical bases are moved when the tactical operation can not be supported from the current location.

(2) Normally the battalion trains are located in the brigade base. If the companies of the battalion can be supported from the brigade base, the unit trains remain there. All units located in the brigade logistical base are under the tactical control of the brigade commander. From combat experience it has been found that battalion supply representatives must be available to the brigade logistical bases to expedite supply operations.

(3) In addition to the normal logistical installations from the support command, other units may be located here. These units include supporting aviation and aircraft maintenance units, water points, and combat and combat support forces not committed.

(4) The brigade logistical base provides facilities to receive supplies arriving by aircraft, to include unloading and transfer to other aircraft by delivery to the user. The brigade's reserve of supply is also maintained at this location.

(5) The Logistical Operations Center (LOC) is the local point of supply operations at battalion and brigade level. This is the shipping point for the majority of the supplies down to company and platoon size units. Helicopters allocated for logistical transportation operate from this base. Each committed battalion will normally require at least 2 UH-1D's for adequate logistical support on a full time basis depending on distance involved.

c. Employment of battalion and company logistical elements.

(1) Battalion combat and field trains normally operate at the brigade logistical base due to extended areas of operation, lack of organic transportation, security requirements, and the method and means of combat service support. The supply, medical, and maintenance elements necessary for the immediate combat service support are located with the battalion command post or as far forward as security and mobility requirements will permit. Elements not needed for the support of forward operations remain at the base camp to facilitate security and enhance the airmobility of combat elements.

(2) Elements/individuals such as the battalion surgeon may be with the combat elements of battalion. If the battalion is operating in a relatively secure area with a road network, the logistical units may be organized into a combat trains and a field trains.

(3) If a battalion logistical base is employed beyond the brigade base, it should be located near a resupply airstrip or heliport. The organic logistical resources employed in this separate base should be the minimum essential to provide support. The unloading and loading of aircraft in these areas, the breakdown of supplies for issue, and other functions incident to supply are performed by the battalion logistical unit.

d. Company. In the company, the primary logistical activities are maintenance of individual equipment, requesting supplies as needed, the breakdown of supplies to individuals, and the evacuation of casualties. Company trains in an airmobile operation will be co-located with the battalion trains.

4.6 SUPPORT COMMAND.

a. The command post and major units of support command normally remain at the base camp to provide direct support for units in the base and back-up support for the forward service support elements (FSSE) operating in the forward logistical bases. Support command may use a combination of unit and area support during airmobile operations. This system provides tailored organizations to meet combat service support requirements of committed units.

b. Support command will normally establish air movement and airfield control teams to plan and control airmovement of supplies and services by Army and USAF aircraft. The transportation officer may be assigned to organize and control these teams.

c. Maximum use should be made of ground vehicles within the support command base.

d. Forward supply units are organized from the Supply and Service Company to operate in each brigade forward logistical base. These units operate supply and distribution points for each class of supply, except for repair parts, medical supplies, cryptographic supplies, air delivery equipment, and aircraft parts.

e. Forward support detachments from the maintenance battalion forward support company should operate in the brigade logistical base to provide DS maintenance, including a limited capability for recovery.

f. Recovery and evacuation of materials in airmobile operations is accomplished by aircraft when the use of ground vehicles is unsuitable. Maximum use is made of backhaul for this purpose. This includes items to be repaired and salvage items, however, salvage items have a low priority. If repair is not possible arrangement is made for air evacuation to the maintenance collecting point.

SECTION III

AEROMEDICAL EVACUATION

4.7 GENERAL. The helicopter has been one of the primary causes of the exceptionally low death rate from wounds in Korea and Vietnam. Prior to the use of frontline air ambulance evacuation of casualties there was a significant time lag between the injury and emergency surgery. The doctor has approximately "six golden hours" to initiate treatment for serious wounds. In Vietnam fewer that 1.2% of the seriously wounded who reach medical facilities later die. The helicopter plays an important role in this life saving. Before this subject can be discussed it is necessary to understand the distinction between medical and aeromedical evacuation used in this Handbook.

a. Medical evacuation can be performed by all Army aircraft and denotes that a medical attendant is not on board.

b. Aeromedical evacuation is restricted to special organized air ambulance units under medical command and control and connotes that personnel and facilities are available to provide medical treatment from the pickup point to the treatment facility. These air ambulances are marked with the Geneva Convention Red Cross and normally do not have fixed weapons subsystems.

c. The discussion here will be concerned with the use of aeromedical evacuation since it is the most desirable, and the area that demands additional planning during an airmobile operation

4.8 CONCEPT OF AEROMEDICAL SUPPORT. Aeromedical support is planned to expedite evacuation to a medical facility and reduce the number of personnel lost as a result of wounds or injuries. This will often require aeromedical evacuation of wounded from insecure areas to medical treatment facilities. General requirements are:

a. Aeromedical Evacuation Aircraft. At least one aeromedical evacuation aircraft should be requested per committed battalion during an airmobile operation. This aircraft may fly in support of the operational elements, prepared for immediate evacuation of casualties to previously designated mobile or fixed medical treatment facilities. In order to accomplish this the helicopter should accompany the airmobile column and remain at altitude during the assault to remain posted on unit locations, and be immediately available.

b. Unit Airmobile Aid Station. This element can be established utilizing medical personnel and equipment organic to the committed unit, for battalion or larger unit operations. It provides medical support when no other medical treatment facility is sufficiently close to the operational area. It is established at the primary base of operations. A clearing station may be set up in the brigade logistical base.

c. Once attended at forward airmobile aid stations, casualties are evacuated by aeromedical evacuation aircraft to the fixed medical facility determined by the unit surgeon. When no aeromedical evacuation aircraft is available, transportation may be provided by organic/supporting aircraft. Forward medical stations are often overflown to get patients to required treatment faster.

d. The medical treatment facility supporting the AMF may also be utilized by the supporting aviation unit. The aviation unit flight surgeon coordinates this prior to the operation through the AMF surgeon.

e. The accountability of personnel and their equipment is the responsibility of the parent unit.

4.9 RESPONSIBILITIES OF THE UNIT SURGEON.

a. The surgeon provides medical support to his unit through clinical care, aeromedical surveillance, aeromedical staff advice, and education and training on a continuing basis of all personnel assigned.

b. Support of Airmobile Operations.

(1) The surgeon's role in an airmobile operation is that of aeromedical staff advisor to the airmobile force commander. He may also be the attending surgeon in the objective area.

(2) The unit surgeon should be delegated the responsibility for coordinating all non-organic medical support for the airmobile operations to include aeromedical evacuation, emergency military treatment facilities, hospitalization and other medical support required.

(a) Aeromedical evacuation is the responsibility of the Army Medical Service and is coordinated as follows:

1. Coordinated through medical channels to insure sufficient aeromedical evacuation coverage is available for the mission.

2. Aeromedical surveillance of the tactical area may be performed by the surgeon simultaneously with the aeromedical evacuation coverage of the initial assault to determine the requirement for in-flight and on-site aeromedical support. (Medical evacuation aircraft may be available from the supporting aviation units.)

3. The AMF commander submits his requirement for aeromedical evacuation aircraft through medical channels to the supporting air ambulance unit.

(b) Prior to each mission, the surgeon is responsible for reviewing and estimating the medical response time (time of casualty pickup to casualty reception by treatment facility), for the specific treatment facilities designated to support the operation. He is further responsible to the airmobile force commander for dissemination of this information. His review and estimation should include requirements for medical supplies, equipment and personnel with provisions for emergency resupply of critical medical items.

(c) The surgeon is responsible for the proper utilization of all medical support. As is frequently required by operational demands, organic aircraft must be utilized for medical evacuation when necessary. It is the surgeon's responsibility to insure that necessary supplies and equipment are provided and that training in handling and movement of casualties is provided organic air crews.

(d) It is the responsibility of the airmobile force commander to insure that aeromedical support is adequate by requiring the surgeon, and the aeromedical evacuation aircraft commander to participate and contribute in all phases of mission development.

4.10 ASSIGNMENT. Medical air ambulance units are normally assigned on the basis of one company per field army, corps, independent corps, or task force. Air ambulance detachments are allocated one per division. All units provide:

a. Aeromedical evacuation of critically wounded or otherwise nontransportable casualties to the nearest medical unit capable of providing required surgery and medical treatment.

b. Pickup of casualties from units in direct support of combat troops, except from an airhead or airborne force objective area that is logistically supported by the United States Air Force.

c. Augmentation of ground evacuation units when vehicular evacuation is not feasible or is insufficient.

d. Expeditious delivery of medical personnel and material to meet emergency treatment requirements within the combat zone.

4.11 PROCEDURE FOR REQUESTING SERVICE.

a. Individual missions are based upon requests from units within the field army requiring medical service and upon reports from members of the medical air ambulance units operating in the forward areas. Since the majority of requests for aeromedical evacuation originate in the forward area, the basic concept of mission control is oriented on this requirement. Mission requests are placed in medical channels at the lowest possible level, affording the responsible surgeon the control of type patients for air evacuation. Mission requests normally are processed through medical channels, using direct medical communications systems or common user systems, whichever is faster and more reliable. A sole user channel (common med evac frequency) should be allocated for expeditious aeromedical evacuation requests. In Vietnam many requests flow directly from committed battalions, by radio, to the supporting air ambulance unit.

b. Requests should be approved or disapproved by the AMF surgeon. The AMF surgeon determines if local conditions will affect the air ambulances in reaching the pickup area. If the mission is approved by the AMF surgeon, it is assigned to the medical aviation unit.

c. Aeromedical evacuation support which is not immediately available becomes a corps or field army responsibility. According to doctrine requests normally flow from the unit surgeon (e.g., at brigade level) to the division surgeon, thence directly to the headquarters of the supporting air ambulance company or detachment. This last transmission is monitored by the corps surgeon to keep him abreast of current demands for the service. Adjustments in the commitment of evacuation capabilities between supported divisions are made by the air ambulance unit commander upon instructions from the commander of the medical brigade and in coordination with the corps surgeon, who establishes priorities for support among subordinate units of his corps. The company commander coordinates and receives flight recognition from the FOC. The requesting surgeon is notified as to the estimated time of arrival of the air ambulances. If medical aviation is not available, the request for support is forwarded to the division army aviation element at Division Tactical Operations Center (DTOC) which determines the availability of aircraft. Coordination for the flight is accomplished and the requesting surgeon is informed of the decision and given all pertinent data concerning the mission by DTOC.

4.12 AEROMEDICAL EVACUATION REQUIREMENTS.

a. Prior to takeoff unit individual flight clearances will be obtained to avoid interference with tactical operations.

b. In order for the AMF surgeon to evaluate and establish priorities for evacuation, requests must contain the following:

(1) Requesting unit.

(2) Number of patients to be evacuated.

(3) Types of injuries--be specific.

(4) Exact location of the pickup site by grid coordinates (coded) and relation to a prominent terrain feature.

(5) Marking of pickup site.

(6) Time patients will be ready for evacuation.

(7) Obstructions to flight and enemy activities to include requirements for armed escort.

(8) Type of personnel composing the ground party.

(9) Requests for emergency medical resupply or special equipment required, such as evacuation by hoist.

c. The unit requesting air ambulance service is responsible for selecting and properly marking the pickup site and for loading the aircraft. Supervision of the aircraft loading is the aviator's responsibility.

d. It is not the mission of air ambulances to evacuate dead, although it may be done.

SECTION V

AVIATION LOGISTICAL REQUIREMENTS

4.13 RESPONSIBILITIES. The logistical problems inherent to employment of Army aviation must be understood so the AMF commander can properly exercise command over his supporting aviation and carry out his responsibilities in this area.

a. Aviation Commander. The aviation commander is responsible upon receipt of an airmobile operations order to effect immediate coordination with the unit that is directed to provide logistical support. Aviation requirements for all classes of supplies should be coordinated and requisitioned throughout the planning and execution of the operation.

b. The supported commander's major role in aviation logistics is to require the Aviation Commander to keep him informed of aviation requirements that affect his decisions. He should always include the Aviation Commander or his representative as a member of the reconnaissance party when selecting possible base sites where helicopter refueling, rearming or aviation logistical support is expected. The selection of base sites requires logistical consideration and is normally the desired location for primary aircraft refueling. Forward tactical command posts often require a limited helicopter refueling and rearming capability and should be considered when selecting such a location. One significant responsibility of the supported commander, is the physical security of forward aviation operating sites. The aviation unit is not organically capable of providing its own security and if forced to do so, its ability to perform its mission will be adversely affected. Security requirements should be directed by the commander with the overall mission control responsibility.

4.14 AVIATION POL.

a. A key factor in the success of an airmobile operation is the efficient and expeditious refueling of helicopters. This allows maximum aircraft availability during a critical time period when helicopters are needed. The limited endurance of the turbine powered helicopter causes refueling to become a major controlling factor in the operational plan.

b. Initial Planning. Upon receipt of the operation order and briefing of a proposed air-mobile operation, the aviation unit must immediately begin plans for the location of its refueling assets. The following factors must be considered:

(1) Proximity to Area of Operation. The closeness of refueling to the area of operation means more aviation support to the supported unit.

(2) Security. Every effort should be made to locate in a secured area to reduce security troop requirements.

(3) Proximity to Logistics Support Area. The consideration of the location of the logistics base is an extremely important factor to the Aviation Commander. While delivery of POL is the responsibility of the unit providing logistical support, the distance between helicopter refueling sites and the log base should be as short as possible because distant refueling areas can create problems for both the supported and supporting units.

(4) Soil Condition. Sand and dust can cause damage to helicopters. Mud can immobilize refueling equipment.

(5) Size of the Area. Generally an area 200 feet square, free of obstacles, is required to safely contain four UHID type helicopters for both day and night refueling operations.

(6) Air traffic control and artillery coordination. Generally the aviation unit can accomplish this through the use of pathfinders. Pathfinders will control the air traffic in the refueling area.

(7) Average Fuel Requirement. This can generally be determined from the overall scope of the operation which will provide information to the aviation commander on how many helicopters will be needed daily and the average number of flying hours required.

c. It is the responsibility of the supported unit to insure that supporting aviation units will have adequate fuel to lift the required combat power into the LZ. When several lifts of the supporting aviation units are required, stagefields with adequate POL reserves, pumps and handlers must be located as near as feasible to the operational area. This reduction in turnaround time will greatly facilitate the rapid buildup of combat power in the LZ.

4.15 CLASS V SUPPLIES.

a. The Aviation Commander will normally position his helicopter Class V basic load at his POL sites. This procedure provides ammunition near the operating area and improves overall efficiency by allowing a helicopter to refuel and rearm at the same time.

b. At the staging area aircraft will normally park by unit. The armed helicopters are furnished a separate parking area. This enables them to park facing away from other aircraft and activities reducing the chance of an accident due to inadvertent firing of any of the weapons systems. The rockets should be preassembled once located near the parking area with one stack of rockets per two aircraft. Machine gun ammunition (7.62 linked) and 40MM grenades should also be prepositioned next to the rockets. Care must be exercised in assembly of the rockets to insure the rocket head is locked into the rocket motor. The above actions may often be required of the supported unit, to substantially reduce turnaround time of armed helicopters.

4.16 AIRCRAFT MAINTENANCE.

a. All airmobile operations are dependent upon the continued availability of aircraft. The decided availability can be realized only if command attention is devoted to planning maintenance with the same concern as devoted to tactical aspects of the operation. Physical planning

is the responsibility of the Aviation Commander, however, the support commander must accept a planned maintenance program and plan his tactical and logistical requirements to operate within such a program. A scheduled program of maintenance is the key to safe operating aircraft, and a steady availability rate. This program can not hope to succeed without the full understanding and support of the supported commanders.

b. Day to Day Planning. The goal of such planning in Vietnam is to provide commanders with the established levels of mission-ready aircraft, 80% for the UH-1 B & D and 60% for the CH-47A. Support facilities are geared to efficiently perform maintenance on approximately 20% of the utility helicopers and 40% of the medium cargo helicopters at any one time. If these figures are continually approximated, the supported AMF commander will receive the maximum support possible over a sustained period. Total support will be a function of the flow rate of the downed aircraft through the maintenance facilities. Maintenance efforts can be planned to provide peak availability for short duration-high intensity operations. A post operation decrease in lift requirements should be planned to allow the maintenance support facilities time to catch up on excess aircraft downed for scheduled maintenance.

CHAPTER V

COMBAT SUPPORT

SECTION I

COMBAT SUPPORT UNITS AND FIREPOWER

5.1 GENERAL.

a. Combat Support Units. Combat support units assist the Airmobile Force in accomplishing its mission. These units and means may be organic, attached, in direct support, in general support, or under operational command of the airmobile force. Examples of nonorganic units which may be available to the AMF in the combat support role include assault helicopter, assault support helicopter units, engineer units, and ground and aerial artillery units. Firepower is either direct, as delivered by aerial rockets, or indirect as delivered by mortars or ground artillery. Firepower is composed of organic fires directly controlled by the AMF commander, and those supporting fires that are available and responsive to him in an attached or supporting role. The commander is responsible for the coordination of all available supporting fires and the integration of these fires into his plan.

b. Firepower. The firepower available to airmobile forces consists of the conventional means available to other type forces plus fire support of organic aircraft. Conventional artillery basically is employed on the same principles though subject to differences in movement capability. For airmobile forces, the normal prime movers for the artillery are helicopters, rather than ground vehicles. This displacement by aircraft provides the artillery with an unprecedented flexibility and mobility. Additional firepower is obtained from the use of aerial rocket artillery which offers suppressive fires both enroute to and in the objective areas. This more rapid movement, geared to the speed of maneuver elements, is a distinct improvement in the conventional techniques of employing artillery support. It does, however, create problems of control and resupply. Armed helicopters are also provided to escort airmobile formations enroute to and from objective areas. These helicopters are designed to provide both suppressive and destructive fires upon those enemy elements that threaten the accomplishment of the airmobile forces' mission. These increases in organic and supporting aerial firepower do not reduce the requirement for Air Force close air support. Rather, airmobile operations require a significant increase in Air Force close air support and air superiority to protect the airmobile forces from enemy air.

SECTION II

ARMED HELICOPTER EMPLOYMENT

5.2 PROTECTION OF THE AIRMOBILE COLUMN.

a. Aerial Reconnaissance of Flight Routes and LZ's.

(1) Prior to departure of the airmobile column, the armed flights will proceed from the loading zone along the designated flight route to the LZ. These aerial reconnaissance flights will arrive at the LZ in time to observe the preparation. Enroute, aerial reconnaissance flights will search for enemy anti-aircraft emplacements and report these and all ground-to-air fire received to the airmobile force commander.

(2) As the airmobile column reaches the (RP) the recon flights begin an armed reconnaissance of the LZ. During this reconnaissance, the artillery preparation should lift or shift to allow the armed helicopters to reconnoiter the LZ. This must be closely controlled and

coordinated prior to the operations and the F.O. must keep all armed helicopters in sight during their reconnaissance.

(3) At the completion of the reconnaissance, the armed helicopters will radio specific information to the leader of the troop carrier helicopters. These instructions should include best approach direction, departure direction, condition of the LZ, wind direction, wind velocity, location of enemy forces or emplacements on or around the LZ, and recommendations for added suppressive fires on the LZ. The armed helicopters may mark the LZ with smoke.

b. Escort. During movement to the LZ from the loading zone, the airmobile column will be provided armed helicopter escort and necessary suppressive fires from other sources.

5.3 EFFECTS OF WEAPON SUBSYSTEMS. The significant effects of various weapons subsystems are shown below:

a. Munitions

TYPE	RADIUS
40mm grenades (M-5 system)	10 meters
2.75 inch FFAR (M-3, M-16, XM-21)	
6.45 pound warhead	6 meters
10 pound warhead	8 meters

b. Probable Error. The probable error of the machineguns on the M-16 and the XM-21 subsystem is dependent on bore sighting, and the ability of the co-pilot/gunner. However, because of the extremely high rate of fire of the XM-21, (2000 SPM/Gun) it is more accurate than the M-16.

c. System Accuracy. The accuracy of all armament subsystems depends upon the skill of the co-pilot/gunner. The accuracy of systems also depends on the direction of attack in relation to the frontline trace. All aircraft systems have a linear dispersion pattern. When the armed helicopter attacks parallel to the front line trace, greater dispersion along the long axis of enemy positions occurs which increases effectiveness and decreases the probability of hitting friendly positions. The ground commander/observer can usually adjust fires closer to his position when the fires are delivered parallel to his frontline because of this minimal lateral dispersion.

(1) Minimum Safe Distances

(a) 2.75 inch FFAR	25 meters
(b) 40mm grenades	25 meters
(c) 7.62mm machineguns	15 meters

(2) The above minimum safe distances are for an emergency combat use only and are not the same as noncombat safety regulations. The ground commander is responsible for troop safety and when employing aerial fire support at close ranges he should adjust the fire using the "close" method of adjustment. The ground commander must assure that his front line trace is marked and the armed flight commander has positively identified this trace.

5.4 SOURCES OF ARMED HELICOPTERS. The type and variety of missions armed helicopters are capable of performing are limited only by the imagination and motivation of the ground commander, the skill of the aviator and the capability of the aircraft and weapons subsystems being employed.

a. Organization. Armed helicopters are available from several sources.

(1) Aerial Rocket Artillery (ARA) - Airmobile Division has one battalion of 36 UH-1B aircraft armed with the M-3 system. Each of these aircraft has 48 2.75" FFAR's. Four to six aircraft will normally provide the AMF with a LZ preparation and ARA fire support during the operation.

(2) Aviation Battalion (Group or Corps) - These units normally include an armed helicopter company. This company has 25 armed UH-1B's organized into three platoons.

(3) Airmobile Company (Lt) - Each company normally has a platoon of eight UH-1B armed helicopters. Most of the aircraft are armed with the M-16 or XM-21 sybsystem. The remaining aircraft will have either the M5/3 or the M-3 armament subsystem.

(4) Air Cavalry Troop. Another source of armed helicopters is the air cav troop of the armored cavalry squadron or air cavalry squadron. The troop normally performs aerial reconnaissance and security missions for the squadron but may be used to support division airmobile operations.

b. In both the armed helicopter company and the airmobile company the basic flying unit is the platoon. Each platoon is subdivided into fire teams of two helicopters. The Platoon Leader normally augments the fires of the fire teams, provides guidance during aerial reconnaissance missions and leads attacks. When one of the fire teams is augmented by the platoon commander's aircraft (or a third helicopter) it is designated as a heavy fire team. The smallest flight of armed helicopters employed in combat is a light fire team of two aircraft. Except in unusual circumstances, armed helicopters operate with a minimum of two aircraft called a light fire team. A typical platoon consists of three fire teams with M-16 subsystems with the platoon commander flying a UH-1 armed with the M-3 or a combination M5/3.

5.5 REQUESTING AND COORDINATING ARMED HELICOPTERS.

a. Requests. Requirements for armed helicopters, except for those required to escort the airmobile column, should be determined as early as possible so that the armed flight leader can assist in the planning requirements. For continuous cover over the operational area, a minimum of four armed helicopters will be required. One light fire team will constantly be over the operational area while the other refuels and/or rearms. A request for armed helicopters will go through command channels and should contain the type mission; number of helicopters required; place and time of reporting; release time; and all special instructions to include communications data.

b. Coordination. The AMF commander should require the armed flight commander to report to the ground unit for a briefing and coordination with the FSCOORD. The briefing must include as a minimum:

(1) Enemy situation - including units, location of AA weapons.

(2) Friendly situation.

(3) Plans of the commander.

(a) Ground tactical plan (including immediate action drill if convoy cover is involved).

(b) Action to take place when the enemy is found (aerial reconnaissance mission).

1. Fire Artillery.

2. Fighter-bomber strikes.

3. Conduct airmobile or ground operations.

(4) Specific area of operations for the armed helicopters, including free zones and areas where artillery is firing.

(5) Control measures.

(6) Time armed helicopters are to be on station.

(7) Specific information desired.

(8) When, where and how information from aerial reconnaissance missions will be reported.

(a) Call signs and frequencies to be used. Provide the frequency for the armed flight and call signs and frequencies of subordinate units.

(b) Unit SOI.

(c) Debriefing arrangements.

(d) Emergency signals.

(9) Action upon completion of mission.

(10) When aerial fire support is to be used rather than artillery or close air support, this should be decided by the FSCOORD prior to the operation to eliminate confusion and delay in providing support.

5.6 MISSIONS FOR ARMED HELICOPTERS. Armed helicopters can perform other missions in addition to furnishing the ground commander fire support. These missions are normally assigned to armed helicopters even though they do not primarily involve fire support. The armed helicopter is able to perform secondary missions for ground commander while maintaining full readiness to perform their primary mission. All commanders should assign secondary missions to the supporting armed helicopters when the flight commander arrives for coordination. Many missions will not necessarily involve a continuous expenditure of ammunition, but are better suited to armed helicopters employment so that aerial fires can be delivered as required.

a. Offensive Fire Support:

(1) Aerial fire support for ground operations.

(2) Pre-strike of landing or drop zones.

(3) Assistance in disengagement and withdrawal by air.

(4) Overhead cover for ground operations -- (secondary missions may include flank screen, rear area security and escorting aeromedical evacuation helicopters).

(5) Ground convoy escort (may include aerial route reconnaissance).

(6) Support of eagle flight.

(7) Escort of unarmed aircraft.

(8) Economy of force missions.

(9) Rapid reaction missions.

(10) Adjustment of close air support (armed helicopters can fire rockets into a target and/or mark with smoke grenades).

(11) Participate in all offensive, defensive and retrograde operations.

(12) Engage enemy forces and targets of opportunity.

(13) Assist in anti-tank defense.

(14) Population control (engage moving targets during curfew hours).

(15) Provide the commander with the capability of immediate confirmation and/or destruction of targets detected by aerial surveillance.

b. Aerial Reconnaissance and Security Missions: These missions may be performed during operations, in support of the overall ground gaining effort, in the preparation and planning for an operation, or in lieu of an operation.

(1) Aerial Reconnaissance to include the technique of reconnoitering by fire.

(a) Area Reconnaissance.

1. Armed recon of landing and drop zones just prior to landing of transports or air dropping of parachute forces.

2. Initial recon of proposed LZ's and DZ's by the airmobile force commander.

3. Specific reconnaissance of areas or points.

(b) Zone Reconnaissance.

1. Recon of designated zones for the purpose of:

a. Conducting ground operations.

b. Plotting movement of enemy forces.

c. Interdicting enemy movements.

(1) Striking with armed helicopters.

(2) Adjusting artillery fires on enemy forces.

(3) Adjusting close air support on suspected and confirmed targets and conducting a post-strike analysis.

2. Area reconnaissance - (areas too large or impenetrable by the ground cav sqdn.)

3. Zone recon in advance of the division in a movement to contact and between ground cav units in route reconnaissance.

4. Reconnaissance of designated zones to detect enemy activity.

(c) Route reconnaissance.

1. Prior to movement of ground convoys or road clearing operations. Accomplished both prior to and during the operation, may involve a flank guard mission during movement of the convoy.

2. At the conclusion of a road clearing operation. Provide flank and rear security for the ground forces proceeding out of the area.

3. Prior to an offensive operations.

4. During the defense to assure supply routes for the counter-attacking force remain usable.

5. Assist in straggler control.

6. Identify likely avenues of approach into friendly positions or the most suitable avenues of approach for friendly forces.

(d) Screen.

1. Between a ground flank screen and the unit being screened.

2. Between units on the battlefield.

3. To the front, flank, or rear of a unit, or reinforcement of a cav unit providing the screen.

4. Between a covering force and the unit being covered; this would only include responsibility for maintaining visual or radio contact.

5. Between the GOP and COP or between the COP and the FEBA.

6. Forward of the FEBA after the security echelon has withdrawn.

(2) Security Missions.

(a) Flank guard. Armed helicopters have a limited capability as a flank guard although they can be utilized when the ground unit is providing for its security by rapid movement. An air cavalry unit may be given a flank guard mission when the flank of a unit contains inaccessible terrain or is protected by natural obstacles.

(b) Rear area security. An air cav troop or combination of armed helicopters, unarmed helicopters, and infantry is ideal to detect, engage, and destroy enemy forces penetrating the rear or base area.

(3) Radiological surveys conducted with the helicopters.

(4) Reconnaissance in force using large numbers of helicopters to conduct a raid.

(5) Extending the range and capabilities of the ground cavalry.

(6) Providing an air combat outpost (covering force) for withdrawal by air. Withdrawal by air of ground forces is a complex operation. It is a situation of diminishing security and some means must be made available to protect the ground unit as it assembles and withdraws by air from the pickup zone. Armed helicopters can fill this security gap by providing cover until the force has been extracted.

SECTION III

CALLS FOR AND CONTROLLING OF AERIAL FIRE SUPPORT

5.7 GENERAL. The call for fire stated herein is applicable to aerial rocket artillery and armed helicopters. This system conforms as near as possible to the existing artillery call for fire as stated in Department of the Army Training Circular 6-1, dated 1 September 1966.

5.8 CALL FOR FIRE. During emergency or immediate requests for armed helicopters the call for fire will normally be processed through fire support channels. The ultimate decision to employ armed helicopters or aerial rocket artillery will rest with the fire support coordinator acting under the guidance of the force commander. This step may be eliminated if prior coordination between the force commander, the FSCOORD, subordinate unit commanders and the armed flight commander, has established when the armed helicopters can be used without further coordination.

a. Observer Identification. The same as in any call for fire.

Example: "Headquarters 6, this is Merit Badge 51."

b. Warning Order. The standard term "Fire Mission" will be used.

Example: "Headquarters 6, this is Merit Badge 51, Fire Mission, Over."

c. Location of Target. Both direction to the target from the observers location and the target location should be given if known. Grid coordinates can be extracted by fire direction personnel and passed on to the helicopters as a reference for movement to the target area, especially when the helicopters are not on station. Direction from the observer must be given in degrees or cardinal headings such as south, northwest or south by southwest, etc.; or referenced from a prominent geographical terrain feature.

Example: "From my position distance 500 meters, direction, northwest, over."

d. Description of the Target. Will remain the same as any call for fire. Adverse weather conditions or hazards to aerial flight (power lines, etc) would be given here if appropriate, to include pertinent enemy information.

Example: "Heavy machinegun"

e. Method of Engagement. Remains the same as other calls for fire except under "type of adjustment" DANGER CLOSE will be included when friendly troops are within 600 meters of the target, i.e., DANGER CLOSE SOUTH 300 METERS.

f. Method of Fire and Control.

(1) Method of Fire. Safety of the friendly troops is the responsibility of the ground commander. Therefore the method and direction of attack must be acceptable to the ground commander.

(2) Method of Control. All adjustments are given as corrections just AS CONTROLLING OTHER TYPES OF FIRE SUPPORT.

Example: If the strike is 100 meters short and 200 meters to the left of the target along the observer-target line the adjustment given to the aircraft would be "Right 200, Add 100, over."

(3) Additional Information.

(a) Upon arrival of the aircraft in the target area the aircraft would contact the ground force. Specific information as to the exact location of the friendly force and further identification of the target location will be given directly to the aircraft by the ground force.

1. Identification of Friendly Ground Force. This may be accomplished through the use of an array of means; i.e., smoke, panels, etc. Time permitting, the system used should define the outer periphery of the ground force, or the vehicle where the observer is located in the case of a convoy.

2. Target Location Identification. Specific target location information is usually given with reference to the friendly ground locations. It should be noted that when giving direction to the aircraft, degrees rather than miles must be used Cardinal and half cardinal headings such as north, southwest, etc., can also be used.

(b) The aircraft commander will identify to the ground unit, the markers used for position location, the attack heading to be used, and if he sees the target he will so state. This corresponds to the message to observer.

(c) Sample Mission. The friendly ground unit has discovered an enemy machinegun 500 meters from his position on an azimuth of 360° (6400 mils). A call for fire has been initiated through channels and armed helicopters have been employed to engage the target. For this example, the man on the ground will be termed the observer.

AIRCRAFT: Merit Badge 51 this is Dragonfly 36, (AB 1020), Mark your position, Over.

NOTE: AB 1020 is the target number which may be assigned.

OBSERVER: Dragonfly 36, this is Merit Badge 51, Roger, Out.

AIRCRAFT: Red Smoke, Out.

OBSERVER: From smoke, Direction 360°, Distance 500 meters, machinegun, panels mark my flanks, adjust fire, Over.

NOTE: For adjustment the observer-target line will normally be used, if the aircraft-target line is used it must be announced to the aircraft.

AIRCRAFT: I see the target from smoke Direction 360°, Distance 500 meters, machinegun, yellow panel left, red panel right, attack heading 045°, Out.

NOTE: If any position of the readback is incorrect, the ground observer will initiate a transmission to correct the error or require further identification information.

A pause of a few seconds may occur here as the aircraft maneuver to get into position to attack and the armed element commander gives his fire command to his elements.

AIRCRAFT: Rockets, Shot, Over.

OBSERVER: Shot, Out.

OBSERVER: Right 50, Add 100, Over.

AIRCRAFT: Right 50, Add 100, Out.

AIRCRAFT: Shot, Over.

OBSERVER: Shot, Out.

NOTE: (Second rounds were on target.)

OBSERVER: Fire for Effect, Over.

AIRCRAFT: Fire for Effect, Out.

AIRCRAFT: Shot, Over.

OBSERVER: Shot, Out.

OBSERVER: End of Mission, machinegun destroyed, Over.

AIRCRAFT: End of Mission, machinegun destroyed, Out.

5.9 MARKING OF THE FRIENDLY LINES.

a. Daylight. Several methods can be used depending upon the ground commanders resources and ingenuity.

(1) Smoke grenades. One of the most common means of marking the friendly positions. Several rules must be observed if smoke grenades are used.

(a) Don't use green smoke in the jungle.

(b) Let the aviator call the color the smoke you use. The enemy can monitor your transmission and throw the same color smoke you have called.

(c) Don't use smoke in open terrain, particularly when you are within 300 meters of the enemy. It will disclose your exact position.

(d) Smoke grenades don't burn well in water, try to locate a fairly dry surface.

(2) Signal panels (orange or red). Panels are particularly useful in open terrain. Tie them on the back of the troops in the vicinity of the CP and the flanks. They can be quickly unrolled while still tied to the suspenders as the troops drop to the prone position.

(3) Painted helmet liners.

(4) Sheets.

(5) Tracers.

(6) Star clusters.

(7) Any device easily seen from the air and which will contrast with the background.

b. At night the entire perimeter should be lit to preclude the armed helicopters from firing over your location or into the perimeter.

(1) Tracers.

(2) Flares.

(3) Electroluminescent panels.

(4) Chemiluminescent panels.

(5) Fire arrows.

(6) One gallon cans half full of sand (dirt) and fuel will burn for approximately thirty minutes and provide an excellent means of lighting the perimeter.

5.10 CONTROLLING AERIAL FIRE SUPPORT DURING CONVOY MOVEMENT.

a. General. Prior to movement, the convoy commander should coordinate with the armed helicopter element commander. Reaction time to an ambush on a road is limited to a few moments. Adequate armed helicopters should be available to provide continuous overhead cover during the movement of the convoy from its SP until the convoy is closed at its destination.

b. Calls for, and Controlling of Aerial Fire Support. Using the clock system all of the aforementioned calls for fire and controlling of the aerial fire support elements remain the same with one exception; the direction the convoy is travelling becomes 12 o'clock and all calls for fire and adjustments are made on the clock system; 3 o'clock being the right flank, 6 o'clock the rear, etc. Rather than marking direction to the target by degrees. This should be coordinated with the aerial fire support elements prior to your movement. In addition to a requirement for being on your frequency and knowing your location within the convoy, the armed element commander must be familiar with your immediate reaction drill. Personnel under fire should immediately react by throwing smoke of a previously determined color to the side of the road from which fire is being received. This will bring an immediate response from the armed helicopters before radio transmissions for assistance can be interpreted.

5.11 DIRECTION OF ATTACK. The ground commander is responsible for troop safety. A situation might arise when the armed flights desire to attack either over the heads of the friendly forces or directly towards the front line trace. When armed helicopters fire over the heads of the friendly forces the chances of hitting the friendly troops increase and the long axis of the beaten zone is perpendicular to the long axis of the enemy. When the armed helicopters attack from behind the enemy position towards the friendly forces long rounds may cause injury to friendly forces.

CHAPTER 6

PATHFINDER OPERATIONS

SECTION I

INTRODUCTION

6.1 PURPOSE AND SCOPE.

a. This chapter is a guide for commanders and staffs of all Infantry, artillery, aviation, and other units with an airmobile capability in employing Army pathfinders to provide navigational assistance to and control for Army aircraft during the conduct of airmobile operations. In addition, this information is required for training unit personnel in pathfinder procedures, and is a guide for selection and establishment of helicopter and fixed wing landing sites and other type aerial delivery areas.

b. The tactics, techniques, and procedures described herein for the organization, planning, preparation, and execution of various types of missions are not inflexible rules, but are guides which commanders should modify as the varying conditions of airmobile operations require.

c. Further information can be found in FM's 57-38 and 57-35.

6.2 MISSION.

a. The primary mission of Army pathfinder units is to provide navigational assistance to and control of Army aircraft in areas designated by the supported unit commander.

b. Secondary missions for the pathfinder unit include providing limited advice and physical assistance to the lifted unit in the planning of airmobile operations and the preparation and positioning of personnel and loads.

6.3 ORGANIZATION.

a. The basic pathfinder unit consists of two officers and 13 enlisted men. Each member of the unit may be a qualified parachutist. He must be cross trained in the duties of other unit members.

b. Depending upon where they are found within the TOE structure, the basic pathfinder unit may be referred to as a platoon or a section. Pathfinder platoons are normally separate Army or corps level units. A pathfinder section is assigned to HHC, aviation battalion. A pathfinder platoon (9 officers and 53 enlisted men) is organic to HHC, aviation group, airmobile division.

6.4 CAPABILITIES.

a. Pathfinder units are trained and equipped to:

(1) Infiltrate an objective area by any land, sea, or air means.

(2) Establish and operate electronic and visual navigation aids to assist aircraft in locating a delivery facility (helicopter landing site, landing strip, drop site, or low-level extraction site) within a designated area.

(3) Furnish ground to air voice radio communication to aircraft for the purpose of providing information, guidance, and air traffic control. Pathfinders, through direct coordination with co-located fire support units, provide advisory service to aviators concerning friendly mortar and artillery fires.

(4) Reconnoiter for selection, and perform limited improvement of landing zones for rotary and/or fixed wing aircraft. Pathfinders are trained in the use of demolitions for obstacle removal and have nonelectric demolition kits organic to the section.

(5) Provide advice and limited physical assistance in the preparation and positioning of troops, supplies and equipment for air movement.

(6) Assist in the assembly of air delivered troops, supplies or equipment.

(7) Conduct limited CBR monitoring or survey of areas subjected to CBR attack and report conditions which would influence military operations.

b. Each pathfinder section is organized and equipped to establish and operate:

(1) Day or night control facilities for the simultaneous operation of four helicopter landing sites. The extent of night operation at these landing sites may be limited by the amount of lighting equipment organic or available to the pathfinders. Included is the provisions for manning one release point (RP).

(2) Two day or night fixed-wing airfields.

(3) Three day or night resupply or personnel drop zones.

(4) Three low-level extraction (LOLEX) zones.

6.5 LIMITATIONS. Organic personnel and equipment strength of pathfinder detachments requires employment limited primarily to aircraft guidance. It is necessary that these detachments be augmented by additional personnel from a supported unit to:

a. Provide security.

b. Remove major obstacles.

c. Recover and assemble equipment and supplies.

d. Operate additional radios nets and telephones.

e. Transport items of equipment.

SECTION II

PLANNING

6.6 INITIAL COORDINATION. At the earliest practicable time, the appropriate level commander issues a warning order alerting the pathfinder unit of its forthcoming support mission. The pathfinder commander establishes liaison with the commander of the supported aviation unit as soon as possible after receipt of the warning order and joins that unit in planning the operation. In certain situations, pathfinders will accompany ground units during an operation. If this is the case, coordination with the ground unit is effected concurrently or as soon as possible after that with the aviation unit.

6.7 JOINING WITH THE SUPPORTED UNIT.

a. Pathfinders join the supported unit at the appointed time and place. If conditions will allow, final coordination between the airmobile force commander, aviation commander, and

pathfinder commander is accomplished at this time. The pathfinder commander may make recommendations on the conduct of any phase of the operation in which his element has an active part. This coordination includes, but is not limited to, the following:

(1) Departure area and time.

(2) Loading plan.

(3) Air movement.

(4) Landing plan.

(5) Unloading plan.

(6) Assembly plan.

(7) Ground tactical plan.

b. The pathfinder section and the aviation unit are designed to support the tactical operations of the ground unit commander. Several landing zones may be operated within the same objective area, and supported by pathfinders if sufficient personnel and equipment are available. If sufficient personnel and equipment are not available personnel should be assigned to the LZ's with the heaviest air traffic and where artillery is to be positioned. Alternate landing zones and the circumstances under which they will be employed must be prearranged for emergency use. Normally, pathfinders on site may only recommend a change in plans or procedures to the supported unit to insure aviation safety or expedite operations in accordance with changing situations.

6.8 BRIEFING. Each pathfinder must fully understand the specific duties he is to perform in the objective area. He must be thoroughly briefed on communications: location and the operation of proposed landing facilities; on the flight route, flight formation, communications check points, time schedules; and on alternate plans and emergency procedures. He should be given the opportunity to study pertinent maps, air photos, and terrain models of the objective area.

6.9 FINAL PREPARATIONS.

a. Based upon coordinated plans for the operation, the pathfinder commander requests any necessary augmentation in personnel and equipment. Personnel and equipment augmentation must be in keeping with the transportation means to be used in delivering the pathfinder party. When reinforced, the pathfinder party remains under the full command of the pathfinder commander, who is responsible for the functions of the entire team.

b. The pathfinder commander issues his operations order to the section or the element to be committed as soon as practicable. The operations order normally will be issued as a series of fragmentary orders based upon available information or the necessity to disseminate it.

c. A final detailed check is made of the equipment to be used in the operation. Except in unusual situations, all equipment intended for use by a pathfinder element on a given operation should be easily transportable by the personnel involved to insure a dismounted mobility capability.

d. A final weather and operational briefing is normally held at the PZ just prior to departure. A final coordination meeting with the ground and aviation unit commander and the pathfinder commander also is desirable at this time.

6.10 METHOD OF DELIVERY. The normal method delivery of pathfinders into an objective area is airlanding by helicopter. Normally, pathfinders will accompany the assault echelon on the initial lift into the landing site and control all subsequent lifts into the area. This allows the pre-strike to continue until the last practicable moment; prevents compromise of the selected LZ's by early commitment of pathfinders; and minimizes any loss of pathfinders through early commitment. In certain situations where unusually difficult landing conditions exist, the pre-strike may be terminated early to allow pathfinders to enter the site ahead of the first lift to accomplish initial clearing of the area and provide the required aircraft control. If time is available and a high degree of surprise and secrecy is required, pathfinders may be parachuted onto or near the landing site. This type entry is most applicable for night operations, but has obvious inherent disadvantages.

SECTION III

OPERATIONS

6.11 GENERAL.

a. Pathfinders are employed however and whenever necessary to provide the required guidance and control of Army aircraft. In some situations this employment may be only a short-term, mission basis with pathfinders being extracted from the area for employment elsewhere upon completion of the major lift into the area. Aviation units with sufficient pathfinder resources may best support airmobile operations by attaching pathfinder elements to ground units for the duration of the airmobile phase. This may occur down to company level. In such employment, pathfinders provide air traffic control and guidance on an around-the-clock basis for any type airmobile movement or resupply operation conducted by or for the ground unit and supported by the pathfinders' parent aviation unit.

b. In any type operation pathfinders are organized to meet the specific requirements of the mission. In the majority of operations, the pathfinder element at a given landing/drop site will be 3-6 men. A pathfinder section will seldom be employed as a unit at a single location.

c. Upon arrival in the objective area, pathfinders perform a hasty reconnaissance, select desired landing/drop sites, establish the necessary guidance and control aids, and begin clearance and improvement of sites as required. Engineer elements in DS of lifted ground units will assist pathfinders in the improvement of landing sites as necessary. In most situations pathfinders perform two or more of the above functions simultaneously with priority given to rapid establishment of ground-to-air radio communications.

6.12 SECONDARY EMPLOYMENT.

a. Pathfinder personnel and equipment remain assembled in the vicinity of, and in communication with, the supported unit command post except when performing pathfinder duties for subordinate units.

b. When the pathfinder detachment has completed preparations to perform further missions, it may be employed within the command post of the supported unit to:

(1) Assist in aviation unit base airfield control.

(2) Assist in minor demolition work.

(3) Assist staff sections by performing map and aerial photo work.

(4) Augment local security by acting as interior and exterior command post guard.

c. Training and maintenance should take priority over performance of secondary missions.

d. A pathfinder unit must be able to perform any of the assigned pathfinder missions with a minimum of notice and preparation.

6.13 LANDING AND/OR DROP ZONE CONTROL CENTER. (Figure 6.1.)

a. General. The purpose of the control center is to control air traffic in and around the LZ, and to promote safe, orderly, and expeditious air traffic. The control center (CC) is the pathfinder command post and communications center for a particular landing or drop site. Its location is selected by the pathfinder site commander upon arrival in the area and is positioned to facilitate visual control of aircraft in and around the landing/drop site. At a drop zone the CC should be located at or near the code letter or the desired execution point at the drop site. The pathfinder commander normally locates himself at the most important site within the landing/drop zone and monitors and/or directs pathfinder operations at outlying facilities by means of the pathfinder internal net if the tactical situation and communication range permit. A CC should be organized to meet the requirements of the mission. Of necessity, however, it may consist of a single pathfinder operating the air-to-ground radio for a limited period of time at a small landing site.

6.14 RELEASE POINT.

a. A release point (RP) is an established traffic control point and final navigational checkpoint for aircraft approaching the LZ and air-delivery aircraft approaching the drop zone (DZ). The RP is also used by helicopter serials as a final coordination point for control of supporting fires in and around landing sites during the initial phase of an airmobile assault. The RP is normally not manned unless the location coincides with a relatively secure area or if extremely difficult navigational problems are anticipated by the aircraft. The location is tentatively selected from map and airphoto studies as a point on the planned flight route to the LZ. It should be a prominent terrain feature which facilitates identification from the air and/or maximum effective use of long-range electronic and visual navigational aids.

b. When the RP is manned, the RP party normally consists of two or three pathfinders, or as minimum may consist of one pathfinder with attachments. The pathfinders position and operate the electronic and visual navigation aids. They also operate radios in the pathfinder internal net (if used) and air-to-ground net. Monitoring the air-to-ground net permits personnel at the RP to respond immediately to requests from aircraft for assistance in locating the RP.

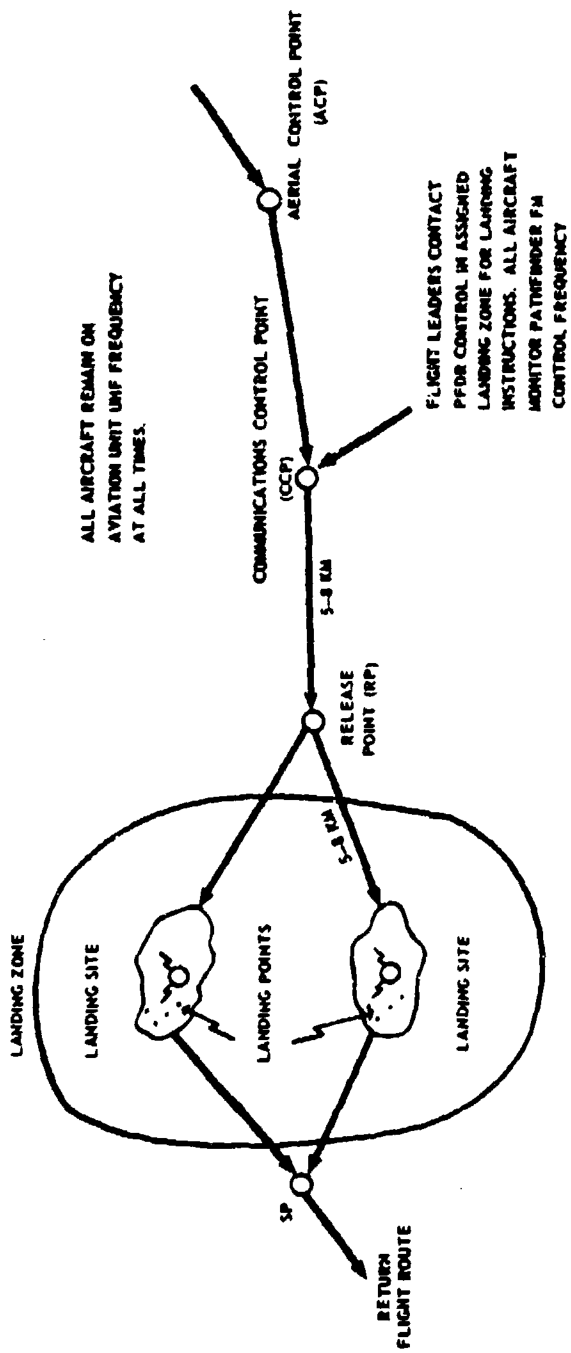


Figure 6.1. Enroute Communications Procedures with Pathfinders in Landing Zone.

SECTION IV

OPERATION OF HELICOPTER LANDING ZONES

6.15 GENERAL.

a. A helicopter LZ contains one or more helicopter landing sites. Selection, establishment and operation of helicopter landing sites is the primary task of a pathfinder section.

b. Many of the techniques and procedures outlined in this section are within the capabilities of trained unit terminal guidance personnel.

6.16 ORGANIZATION AND DUTIES. The pathfinder section is organized for combat to establish and operate the number of installations required by the ground tactical plan of the supported unit. These facilities may all be within a single LZ or widely separated throughout the area of operations. The pathfinder commander normally positions himself at the most important landing site.

a. Control Center and Release Point. A control center is required to be established at each landing site to adequately control air traffic. A RP (manned or unmanned) is established on the flight routes into the LZ as determined by aviation requirements. The CC and RP (when manned) are organized and operated as described in paragraphs 7.13 and 7.14.

b. Landing Site Party. This party consists of a site commander and additional pathfinder and/or attached personnel as required to establish and operate the site. Out of necessity, a single pathfinder could operate a small landing site for limited periods of time.

6.17 SELECTION OF LANDING SITES.

a. Minimum landing space requirements and minimum distance between aircraft depend upon a number of variables and will be covered by aviation SOP's or prearranged by the aviation commander in coordination with the pathfinder detachment commander. The final decision concerning minimum landing requirements rests with the aviation commander. In selecting helicopter landing sites from maps, aerial photographs, and actual ground or aerial reconnaissance, the following factors are considered:

(1) Size of landing point. As a guide, helicopters need a cleared, level, circular area at least 30-75 meters in diameter for landings/take-offs, depending upon the type of helicopter.

(2) Number of helicopters used. An important factor is the number of helicopters required to land simultaneously at one LZ to provide the troop strength needed to accomplish the mission. It may be necessary to provide an additional landing site nearby or to land aircraft in successive flights at the same site.

(3) Landing formation. Planned landing formation may require modification to allow helicopters to land simultaneously in restricted LZ's. It is desirable to land aircraft in the same formation in which they are flying whenever possible.

(4) Surface conditions. Surface conditions must be good enough to prevent helicopters from bogging down, creating excessive dust or blowing snow. Loose debris that may cause damage to the rotor blades or turbine engines must be removed. Dusty or sandy surfaces will cause loss of visual contact with the ground and should be avoided, especially at night.

(5) Ground slopes. Normally, if the ground slope is greater than 15 percent, helicopters cannot land safely. In an area where the ground slope is from 7 to 15 percent, helicopters must land and park side slope. The OH-6A must continue to run on slopes 10-17 degrees to prevent rolling over. It is possible, however, for helicopters to terminate at a hover over ground slopes greater than 15 percent to unload personnel or supplies. (When loading/unloading on slopes, personnel must approach/depart from down-slope.)

(6) Approaches to the landing site. The direction of landing should be into the wind, especially at night. However, if there is only one good approach, or to make maximum use of available landing area, helicopters can land with a light cross wind; or if surface wind is under 5 knots, most helicopters can land downwind.

(7) Prevailing winds. Of the two factors--approach route and prevailing wind--the best approach route is the more important factor unless the cross wind velocity exceeds 10 knots. The ability to land crosswind or downwind will vary depending upon the type helicopter and the load conditions. Smaller aircraft can accept less cross or tail wind than larger aircraft.

(8) Density Altitude. See Paragraph 3.2d.

(9) Loads. Most helicopters cannot ascend or descend vertically when fully loaded; therefore, a large landing area and better approaches are required for loaded helicopters than for empty or lightly loaded ones.

(10) Obstacles. Landing sites should be free of tall trees, telephone or power lines or similar obstructions on the approach or departure ends of the landing area that may interfere with the helicopter landings. Obstacles within the landing area (i.e., rocks, holes, stumps) that cannot be eliminated must be clearly marked. For planning purposes an obstacle ratio of 10 to 1 should be used (i.e., a 20-foot tree needs 200 feet of horizontal clearance from landing points if aircraft must approach or depart directly over the tree).

b. Detailed information of the effects of air density, slope, and surface conditions on landing zone requirements is contained in appropriate TMs. The helicopter unit commander makes the final decision on minimum landing requirements. These requirements must be available to the pathfinder section commander in the form of SOP's or verbal instructions in the early planning stages of the mission.

c. Alternate sites may be needed because of enemy action, ground conditions, or changes in the tactical or logistical situation. The ground commander or his representative decides when alternate sites will be used, at the recommendation of the aviation unit commander and the pathfinder on the site. Pathfinder and aviation unit commanders do not have the authority to shift to alternate landing sites unless such authority has been specifically delegated by the supported ground unit commander.

6.18 ESTABLISHMENT OF THE LANDING SITE.

a. Radios are opened in the air-to-ground and pathfinder internal net (if used) immediately upon arrival at the landing site. These radio nets are monitored at all times until operations at the site are completed.

b. The helicopter landing site commander determines the exact direction of landing immediately upon his arrival. He selects the exact location of the tees for each platoon formation at night and controls the landings and take-offs of helicopters. Normally, no marking at all is used during day operations except smoke or other minimum identification means to mark the touchdown point of the lead aircraft, and for obstacles that may be difficult to detect and impossible to remove (i.e., wires, holes, stumps). It is desirable that a signalman be used to land the lead aircraft day or night.

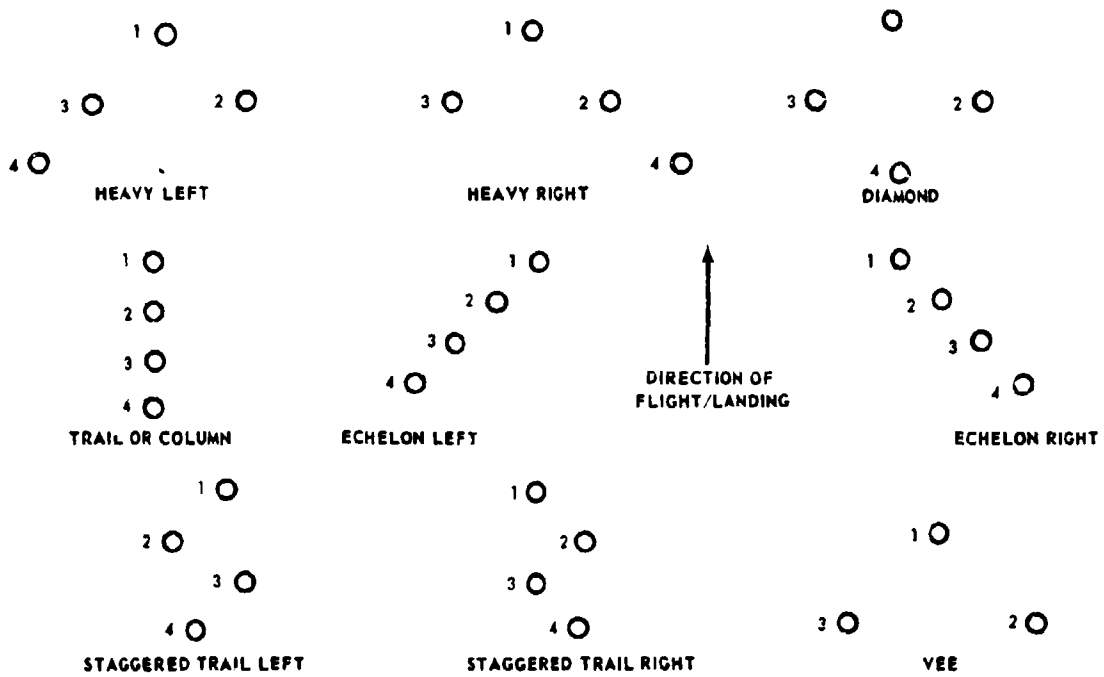


Figure 6.2. Standard Flight and Landing Formations.

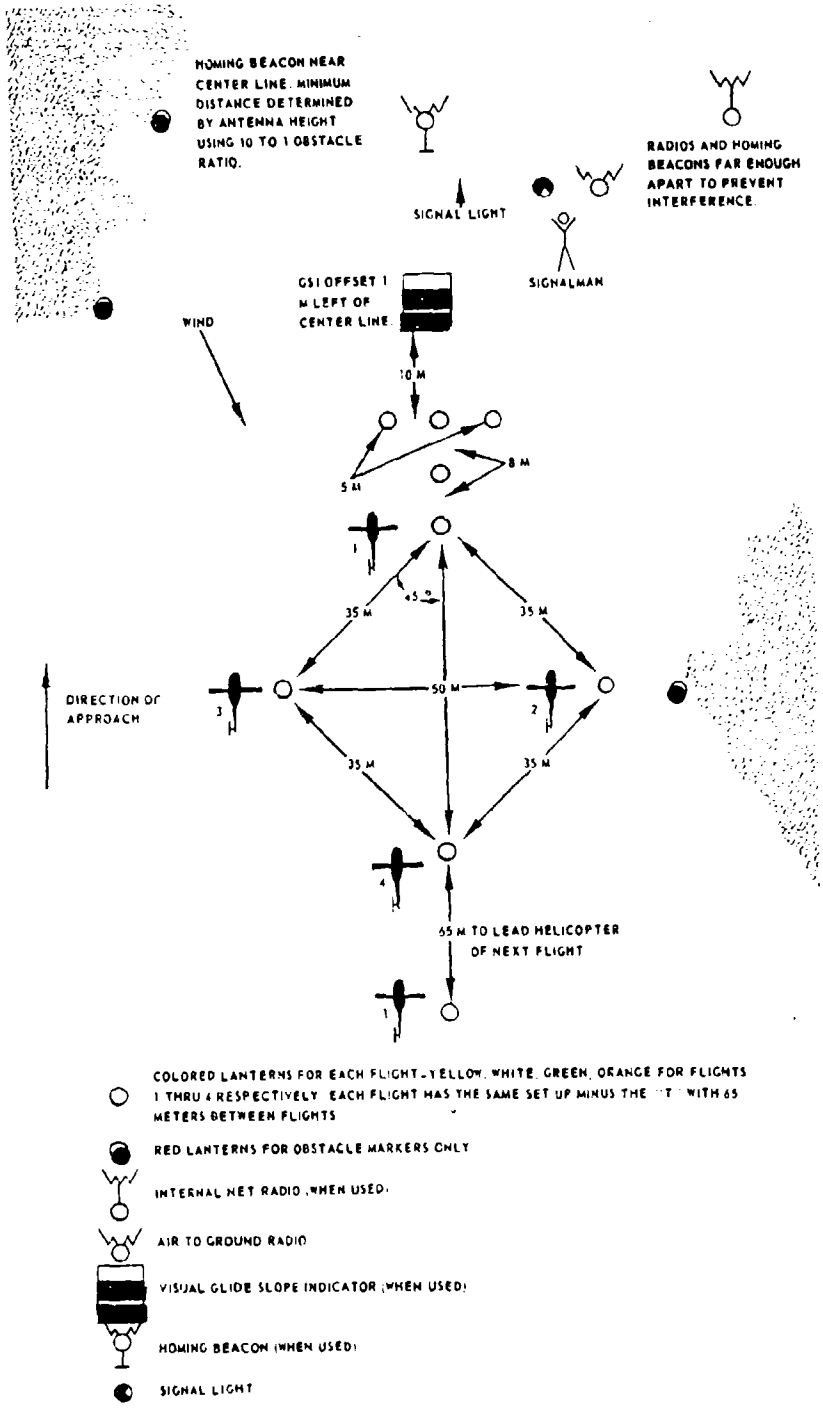


Figure 6.3. Night UH-1 Landing Site; Diamond Formation.

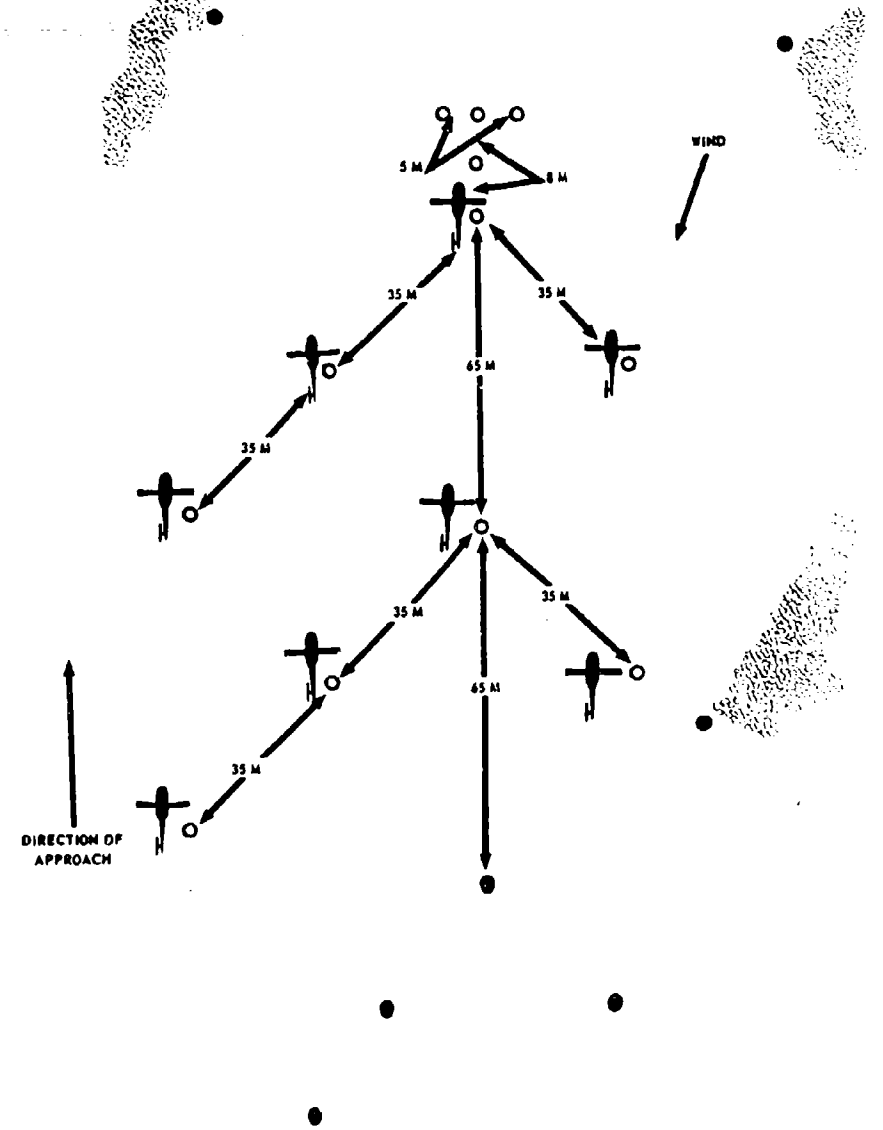
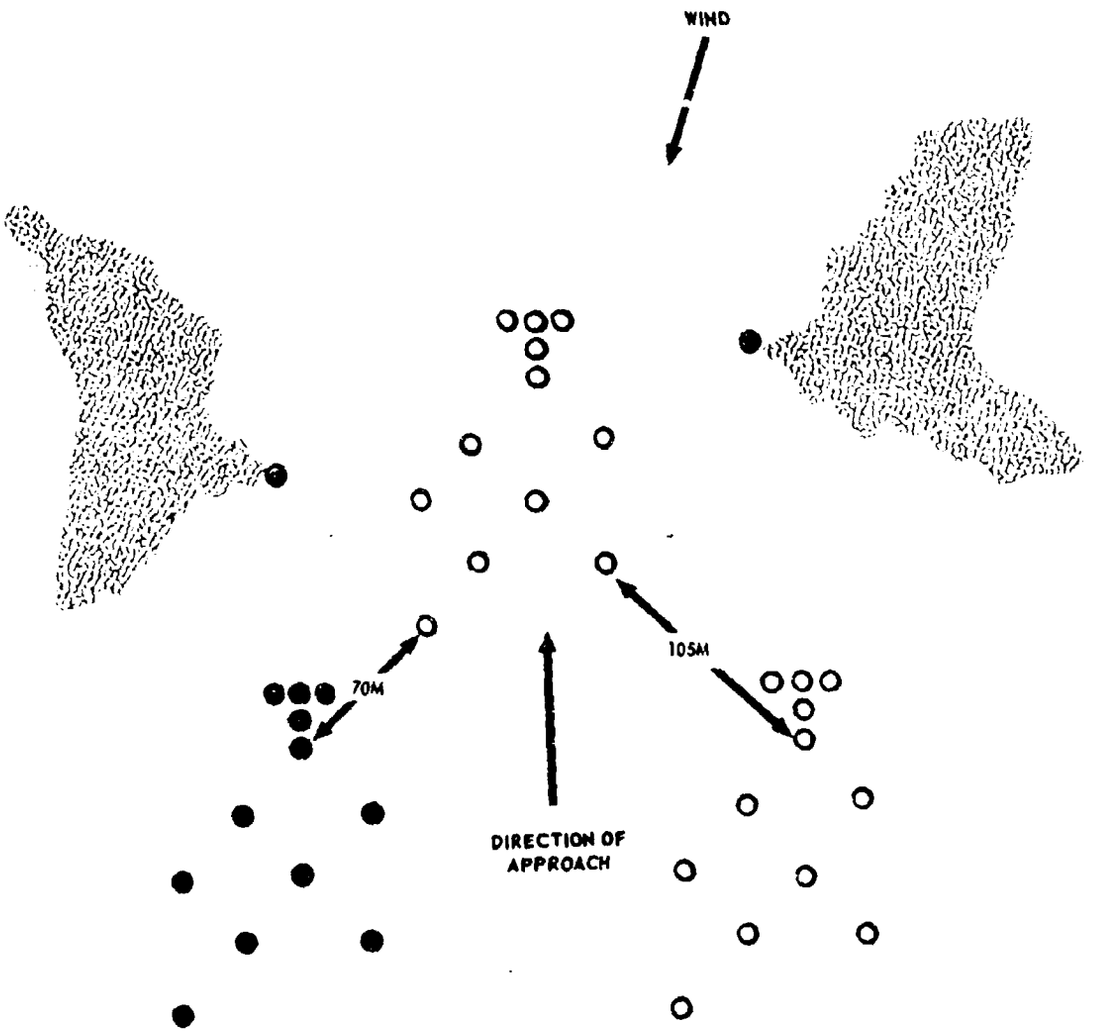


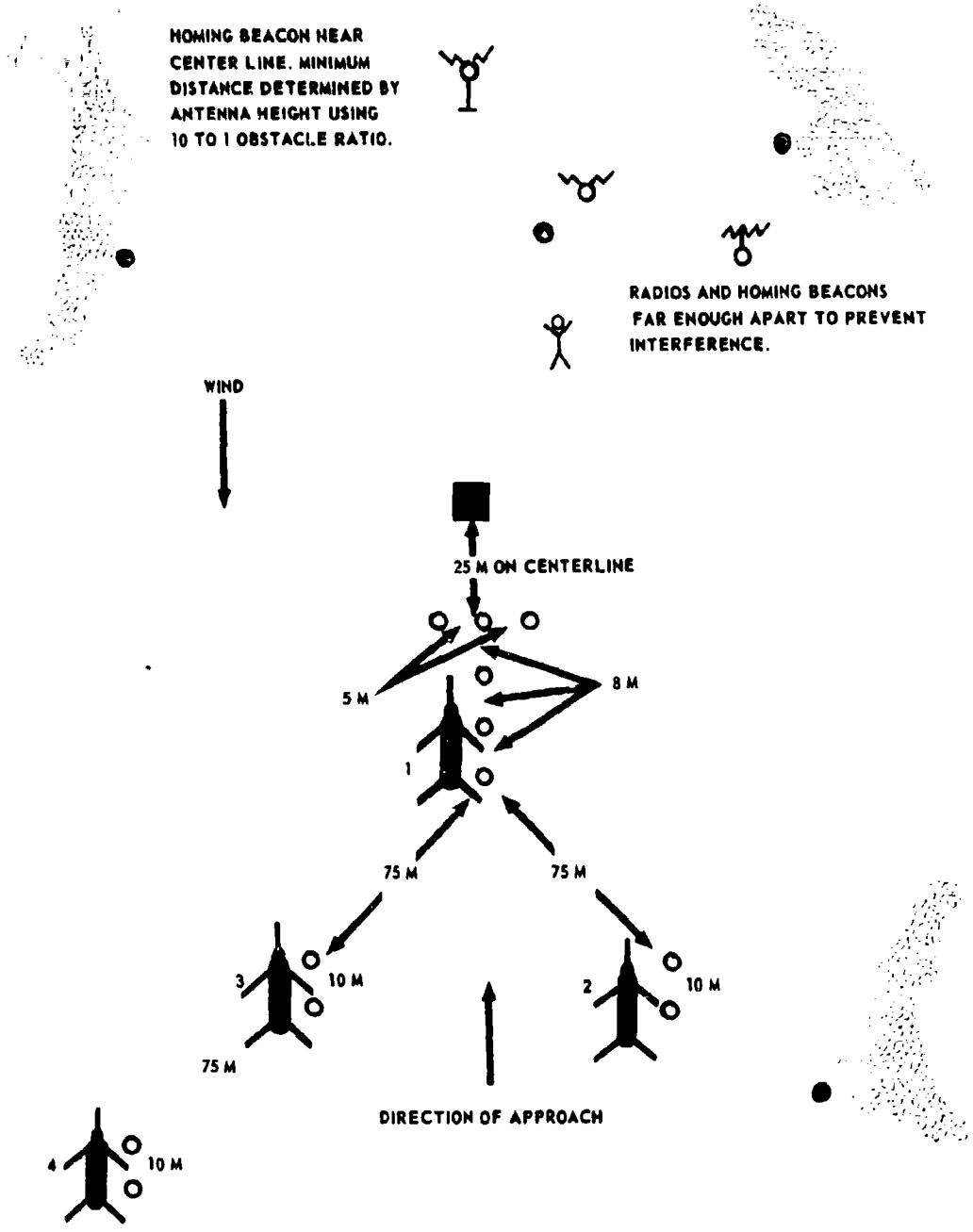
Figure 6.4. Night UH-1 Landing Site; Platoon Heavy Left.



SYMBOLS AND LOCATION OF
HOMING BEACONS, RADIOS,
GLIDE SLOPE INDICATOR
SEE FIGURE 6.3

DISTANCES WITHIN PLATOONS
SEE FIGURE 6.4

Figure 6.5. Night UH-1 Landing Site; Company Vee, Platoon Heavy Left.



NOTE:
SEE FIGURE 6.3
FOR SYMBOL LEGEND

Figure 6.6. Night CH-47 Landing Site; Tactical Heavy Left Formation.

(1) Preferably, helicopters should land simultaneously in the preplanned platoon formations (Figure 6.2.) If it becomes necessary to land the helicopters in a formation different from that in which they are flying, the landing site commander must insure that this information is given to the flight leader as a part of the landing instructions, (Paragraph 6.19) in sufficient time to execute flight changes and notify troops on board. Exact layout of the landing aids is accomplished to prevent helicopters from flying directly over another aircraft on the ground and depends upon available landing space, number and types of obstacles, prearranged flight formations and unit SOP's. When helicopters are to land in trail formation, the landing points should be staggered laterally (Figure 6.2) unless terrain dictates otherwise (i.e., landing on a road) to reduce the danger of collision, especially at night.

(2) Pathfinder TOE landing lights or field expedients are used to mark landing points and indicate the direction of landing for a night operation (Figures 6.3 - 6.6). Ideally, lights of different colors are used to designate different helicopter sites or separate platoons within a larger formation. Blue lights are difficult to detect from the air and should not be used to mark landing points. Tee lights indicate the landing point of the lead aircraft of each platoon and the direction of approach. Additional lights are provided for touchdown points of other aircraft in the platoon. Helicopters land with the right landing gear or skid just to the left of the light. All lights should be off, hooded or turned upside down for security purposes until the last practicable moment when aircraft are inbound. Lights must be beamed in the direction from which the helicopters approach. When flares or aircraft equipped with special lighting sets are used to illuminate landing sites, pathfinders will accompany initial lifts as in day operations and establish air traffic control and at least minimum lighting to identify exact landing sites for subsequent flights.

(3) After selecting the landing site, pathfinders immediately reconnoiter and prepare the landing points. They make hasty improvements at the landing points by removing brush, filling holes, etc. They remove obstacles from the approach and departure paths to the extent of their capabilities and/or mark them with red panels or red lights or both, as required. Improvement of the site should be continued as long as necessary, or until the mission is completed at the location.

(4) Pathfinders may mark initial assembly points for troops, equipment and supplies if required by the supported unit. These points are located to facilitate assembly in order to clear the LZ quickly and efficiently. If unit assembly areas are to be used, they are pre-selected by the ground commander. If the requirement exists, supported ground unit personnel may accompany the pathfinders in the assault echelon to reconnoiter and mark the unit assembly areas, establish aids, act as guides, and assist in subsequent unloading operations to insure rapid clearance of personnel, supplies, and equipment from the immediate vicinity of the landing points.

(5) Pathfinders have a limited security capability. If pathfinders precede the initial assault elements into a landing site, personnel from the supported ground unit may accompany the pathfinders for security purposes.

6.19 OPERATION OF THE HELICOPTER LANDING ZONE.

a. Helicopters approach the landing zone along a designated flight route. They are normally organized into serials containing one or more platoon size flights. One serial may contain a flight for each helicopter site. However, flights of medium or heavy transport helicopters (CH-47, CH-54) carrying artillery or other bulk cargo can often be expected to arrive at landing sites in increments of one or two aircraft at a time. Subsequent flights, if required, follow at minimum time intervals. The minimum allowable time between flights will depend on such factors as the number of aircraft per flight, the configuration of the landing site, and

the nature of cargo to be loaded or off-loaded. Time between successive flights will be determined by the aviation commander during the planning phase of an operation. Once an operation is in progress, pathfinders at the site may recommend changes to insure aviation safety or expedite landings.

b. As each helicopter serial reaches the communications checkpoint (CCP) on the flight route, the leader initiates communications with the appropriate helicopter landing site control center. The CC then furnishes the leader with necessary information concerning the heading from the CCP to RP, enemy situation, wind direction, landing site heading, landing direction, field elevations, landing formation, clearance to approach, landing clearance and any other pertinent information. Normally, all aircraft in flight switch to the pathfinder control frequency, on instructions of the flight leader, prior to reaching the CCP. Radio messages between a landing site CC and a serial containing platoon size flights, with all pilots monitoring, might be as follows:

SPEAKER	TOPIC	MESSAGE
Flight Leader	Identification, location	HOTEL CONTROL, THIS IS HAWK 1 AT CCP; OVER
Pathfinder at Landing site	Acknowledgement	*HAWK 1, THIS IS HOTEL CONTROL
	Heading from CCP to RP	HEADING TWO EIGHT ZERO
	Enemy situation	*ENEMY SITUATION NEGATIVE
	Wind direction, velocity	*WIND THREE ONE ZERO DEGREES AT FIVE
	Landing site heading	LANDING SITE HEADING TWO NINE ZERO
	Landing direction	*LAND TWO NINE FIVE
	Field elevation (normally required only at night)	*FIELD ELEVATION FOUR FIVE ZERO
	Landing formation (if changed from preplanned formation)	*LANDING FORMATION PLATOON HEAVY LEFT, PLATOONS IN COLUMN
	Other pertinent information (if required)	*SMOKE ON CALL, STUMPS ON LANDING SITE, DUSTY SURFACE CONDITIONS, FRIENDLY FIRES, ETC.
	Clearance to approach	*CONTINUE YOUR APPROACH, REPORT ONE MILE FINAL; OVER
Flight leader	Acknowledgement	THIS IS HAWK 1, ROGER; OUT

SPEAKER	TOPIC	MESSAGE
Flight leader	Identification location	*HOTEL CONTROL, THIS IS HAWK 1, ONE MILE FINAL; OVER
Pathfinder at landing site	Acknowledgement and final clearance to land	HAWK 1 THIS IS HOTEL CONTROL, *WIND THREE ONE ZERO DEGREES AT FIVE; CLEAR TO LAND; OVER
Flight leader	Acknowledgement	*THIS IS HAWK 1, ROGER; OUT.

c. Pathfinders must be prepared at all times to provide air traffic control and navigational assistance to any aircraft in and around his landing site in the event these aircraft do not follow a specified flight route. Traffic control between a landing site CC and any aircraft approaching the landing site from a direction other than along a specified flight route would usually include only the information shown above marked by an asterisk.

d. The helicopter formation continues along the flight route to the RP. Aviators are assisted by the electronic and visual navigation aids on the RP, if manned. All helicopters pass over or near the RP, with serial leaders normally reporting passage of the RP to their respective landing site CC and move directly to the assigned landing site. The individual landing site CC furnishes assistance to any flight which cannot locate its site by means of visual signals or steering commands as required.

(1) For a daylight operation, a specified smoke color may be assigned to separate landing sites to aid identification. When smoke is used, care must be taken to avoid starting grass fires or masking the landing points. Smoke should be employed sparingly because it distinctly marks a location not only for friendly forces, but for enemy observers as well. Smoke should be used only in response to an aviator's request for help in identifying or locating a landing site.

(2) For a night operation, pyrotechnics or other visual signals are used instead of smoke. Red signals should be used only to mean DO NOT LAND or to indicate other emergency conditions. Emergency codes should be preplanned.

e. Each flight lands at its assigned helicopter site in the manner indicated by CC messages and visual aids displayed.

f. Pathfinders may use arm-and-hand signals (FM 21-60) with baton flashlights to help control landing or parking of helicopters during night operations.

SECTION V

OPERATION OF FIXED WING LANDING ZONE

6.20 GENERAL. A fixed wing (FW) landing zone has one or more landing strips. A landing strip consists of a runway and may have parking areas, taxiways, and dispersal areas.

6.21 CAPABILITIES, ORGANIZATION AND DUTIES.

a. A pathfinder section is capable of establishing and operating two FW landing strips simultaneously.

b. Pathfinders at a landing strip are organized into three basic groups; a control center, a runway party, and a parking party.

(1) Control Center. Performs duties as outlined in paragraph 6.13.

(2) Runway party. Reconnoiters, prepares, and marks the actual landing area.

(3) Parking party. Reconnoiters, prepares, and marks the taxiways, parking area and dispersal areas. Provides parking and taxi signals for each airplane, and maintains ground communications with the CC.

6.22 SELECTION OF FIXED WING LANDING STRIPS.

a. Landing strip. Detailed factors involved in the selection of FW landing facilities are discussed in TM 5-251.

(1) The surfaces of a landing strip must be smooth enough to permit loaded planes to land, taxi, and take-off without bogging down, damaging tires, ground looping.

(2) The minimum length and width requirements of a landing strip depend upon the type of FW aircraft, types of loads, direction and velocity of the wind, and condition of the ground. Pathfinder commanders coordinate with the aviation commanders to determine the minimum dimensions of landing strips. The final decision rests with the aviation commander. Generally speaking, however, the minimum requirements for a landing strip for tactical Army aircraft and the Air Force CV-2 are as follows:

(a) 1,200 feet in length and 50 feet in width.

(b) Taxiway, parking area and overrun not required.

(c) Minimum 75 feet lateral clearance from centerline of runway.

(d) Maximum runway slope 10%.

(e) Obstacle clearance requirement: Day operations, 20:1; night operations, 30:1. These requirements are based on the average distance required for an aircraft to safely clear obstacles on approach to and departure from the landing strip.

b. Taxiways. Taxiways should be prepared on one or both sides of the landing strip FW if terrain permits so airplanes can clear the strip as soon as possible after landing. Taxiways should be a minimum of 30 feet in width.

c. Parking Areas and Points. Parking areas and points are selected where FW aircraft can load or unload equipment, supplies, or personnel, in accordance with a prearranged plan, without interfering with the continuous operation of the landing strip.

6.23 ESTABLISHMENT OF A FIXED WING LANDING STRIP. Air-to-ground and internal control radios are prepared for operation immediately upon arrival at the landing strip. The pathfinder strip commander reconnoiters the area and selects and points out the exact area to be used for the strip, and taxiways and parking area, if used. For day operations, the strip taxiways and parking areas are marked with signal panels (Figure 6.7). For night operations, they are marked with battery lanterns or field expedients, if necessary (Figure 6.8).

6.24 OPERATION OF A FW AIRPLANE LANDING STRIP.

a. Landings and take-offs by a large number of FW aircraft in a short period of time may present difficult air traffic problems. Radio discipline must be strictly observed to prevent interference with the exchange of messages between the control center and aviators. Plans must be made to handle the large number of helicopters that can be expected to operate into, or in the vicinity of FW assault airfields.

b. Aviation safety requires that fixed wing airfields be operated only by personnel well trained in air traffic control procedures and familiar with the characteristics of the aircraft involved. Exceptions to this rule may exist in isolated situations involving single aircraft. The procedures involved in airfield operations are covered in detail in FM 57-38, TM 11-57-2557-25, AR 95-1, and AR 95-2.

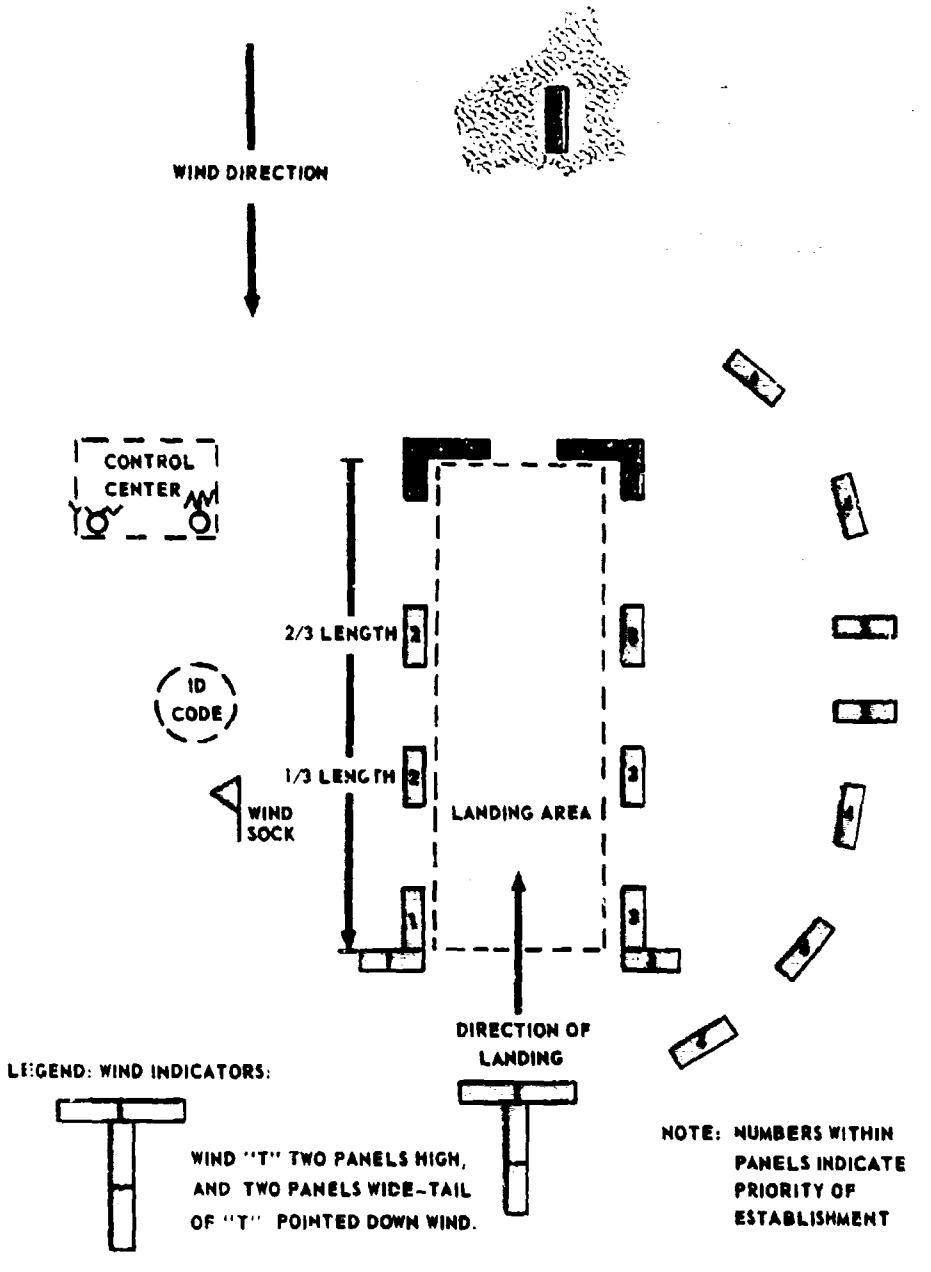


Figure 6.7. Airplane Landing Strip, (Day).

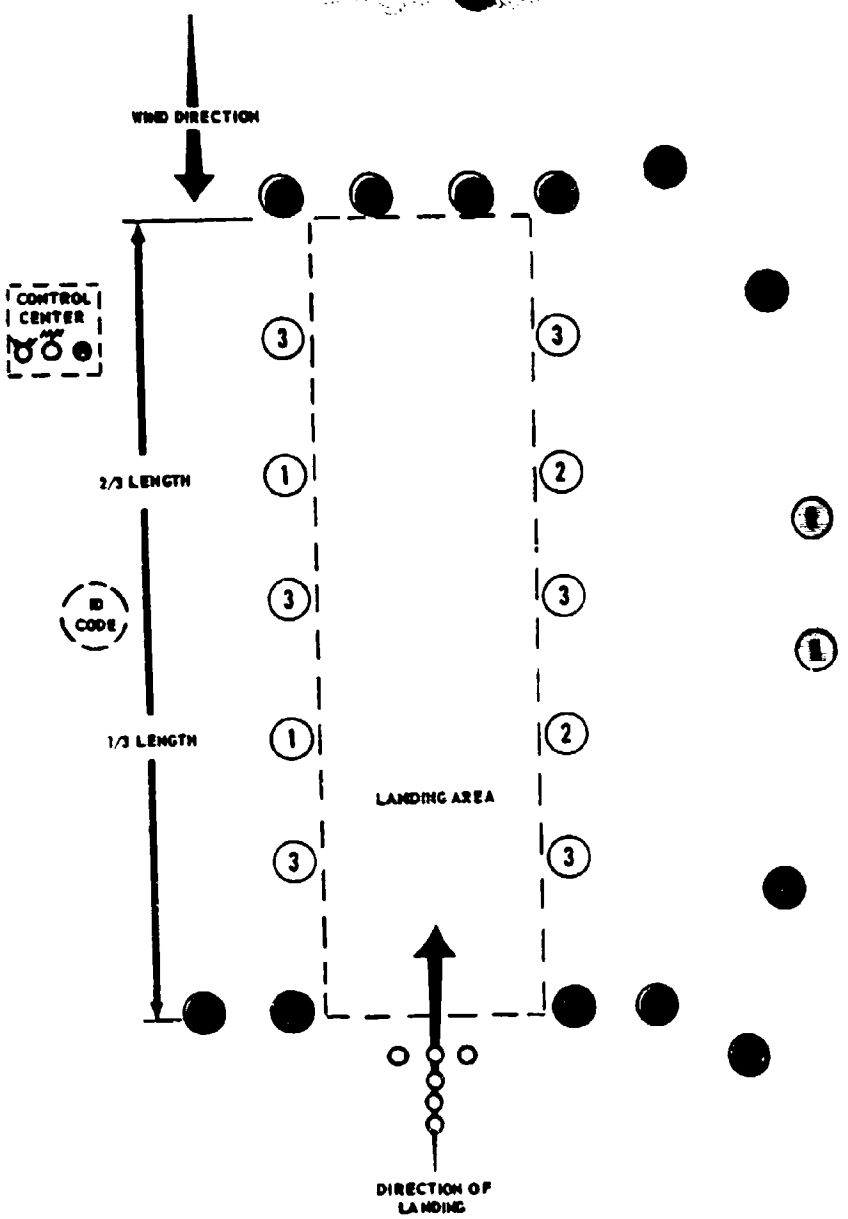


Figure 6.8. Optimum Lighting for Airplane Landing Strip (Night).

SECTION VI

OPERATION OF A DROP ZONE

6.25 GENERAL.

a. A drop zone (DZ) is an area where troops or material are delivered by parachute, or, in the case of certain items, by free drop. A DZ may contain one or more drop sites.

b. The techniques and procedures described in this section may be employed by trained unit terminal guidance personnel to conduct small scale parachute resupply operations.

6.26 CAPABILITIES, ORGANIZATION AND DUTIES.

a. Capabilities: A Pathfinder section is organized and equipped to operate three day or night DZ's simultaneously.

b. Pathfinders at a DZ are organized to provide a control center and a marking party. The marking party clears the area as required and places panels or lights to mark the drop site according to plan and provides limited security if necessary.

6.27 SELECTION OF DROP ZONE.

a. A DZ is located to best support the ground tactical plan. Factors to be considered in its selection are the:

(1) Type aircraft employed.

(2) Altitude at which air-delivery is to be made.

(3) Aircraft formation for air-delivery.

(4) Types of loads to be delivered.

(5) Relative number of obstacles in the area.

(6) Availability of adequate aircraft approach and departure routes.

(7) Method of airdrop, i.e., free drop, high velocity, or low velocity.

(8) Access to the area.

b. The required length of a drop site is computed by using the ground speed of the aircraft and the time needed to release its cargo. The formula is D equals RT, in which Distance (D) is the site length in meters, Rate (R) is the ground speed of the aircraft in meters per second, and T is the time required for the aircraft to release its cargo. To use this formula, airspeed (expressed in knots) must first be converted to ground speed (expressed in meters per second).

(1) To convert knots to meters per second, use this equation: 1 knot equals 0.51 meters per second. Thus, a ground speed of 100 knots equals 0.51 x 100 or 51 meters per second.

(2) It is desirable to fly aircraft into the wind during air delivery because the resulting slower ground speed gives more time over the site and a more compact ground pattern.

c. If a drop site of the desired length is not available, the flight time over the site (whatever its length) must be computed to determine how much of the load can be released in one pass and/or how many passes must be made to release the entire load. The following formula is used: T equals D/R, in which T is the time over the site, D is the length of the site, and R is the ground speed in meters per second.

d. The required width of the drop site depends upon the method and/or type of air drop, wind drift, and the formation of the aircraft.

6. LOCATION AND MARKING OF THE EXECUTION POINT.

a. General. The location of the point on the drop site directly over which the aircraft begins releasing its load, or execution point, depends on the size and shape of the site; the desired point or area of impact for the load; the formation, ground speed and altitude of the aircraft; the number of containers to be delivered and the time required to drop them; and the drift of parachuted loads which, in turn, depends upon the direction and velocity of the wind.

b. Wind Drift Formula. The wind drift formula, D equals KAV, is used to determine the amount of drift of parachutes (in meters) from a given altitude. In this formula, K is a constant that represents the characteristic drift of a parachute of a certain model For T-10 personnel parachutes K is 4.1; for all other parachutes, K is 2.6. The drop altitude of the aircraft (in hundreds of feet) is A, and V is the ground velocity (in knots) of the wind. Wind velocity can be determined with an anemometer or any of several expedient methods (See FM 23-71).

c. Marking of the Execution Point. The execution point is normally marked by a code letter in panels or lights alined with the long axis of the drop site or the desired drop heading (Figure 6.9). However, if necessary this point may be marked by any pre-coordinated means easily identifiable from the air or, in some situations, not at all if the aircraft is under positive ground to air radio control.

6.29 ESTABLISHMENT AND OPERATION OF A DROP ZONE.

a. The pathfinder drop site commander selects the exact location for the code letter (execution point), and alines it on the heading which he desires the aircraft to fly over the site. The marking party completed marking of the area as required. Concurrently, the CC prepares the ground to air control radio, electronic homing beacons (if used) and long range visual signalling aids for operations.

b. Necessary guidance information for the aircraft is compiled by the CC. This information normally includes the following elements:

(1) Magnetic heading (vector) from CCP to the drop site or to an area near the site where the CC can assume visual guidance of the aircraft.

(2) Actual drop heading.

(3) Enemy situation (if applicable).

(4) Drop formation.

(5) Drop altitude.

(6) Any other pertinent information.

c. As the drop aircraft comes into view, the CC gives the aviator verbal steering instructions (steer left/right, on course) to guide him over the code letter, alerts him as when he is approximately ten seconds away from drop (stand-by), and tells him when to release his load (execute, execute). The CC prefaces individual instructions with the call signs of the aircraft concerned.

d. In an extremely restricted drop site, it may be necessary for each aircraft to make several passes over the area, releasing a part of its load on each pass. On such a site, the best drop formation is single aircraft in trail. The CC directs the aircraft to fly over the site in a continuous "racetrack", using either a left or right-hand traffic pattern.

e. In the majority of combat parachute resupply operations conducted at the present time, single aircraft or aircraft in trail will be employed with an actual drop altitude of 300-500 feet and an average bundle weight of 300-500 pounds. This simplifies aircraft guidance procedures and allows for a high degree of delivery accuracy, thus permitting use of relatively small and confined areas as drop sites.

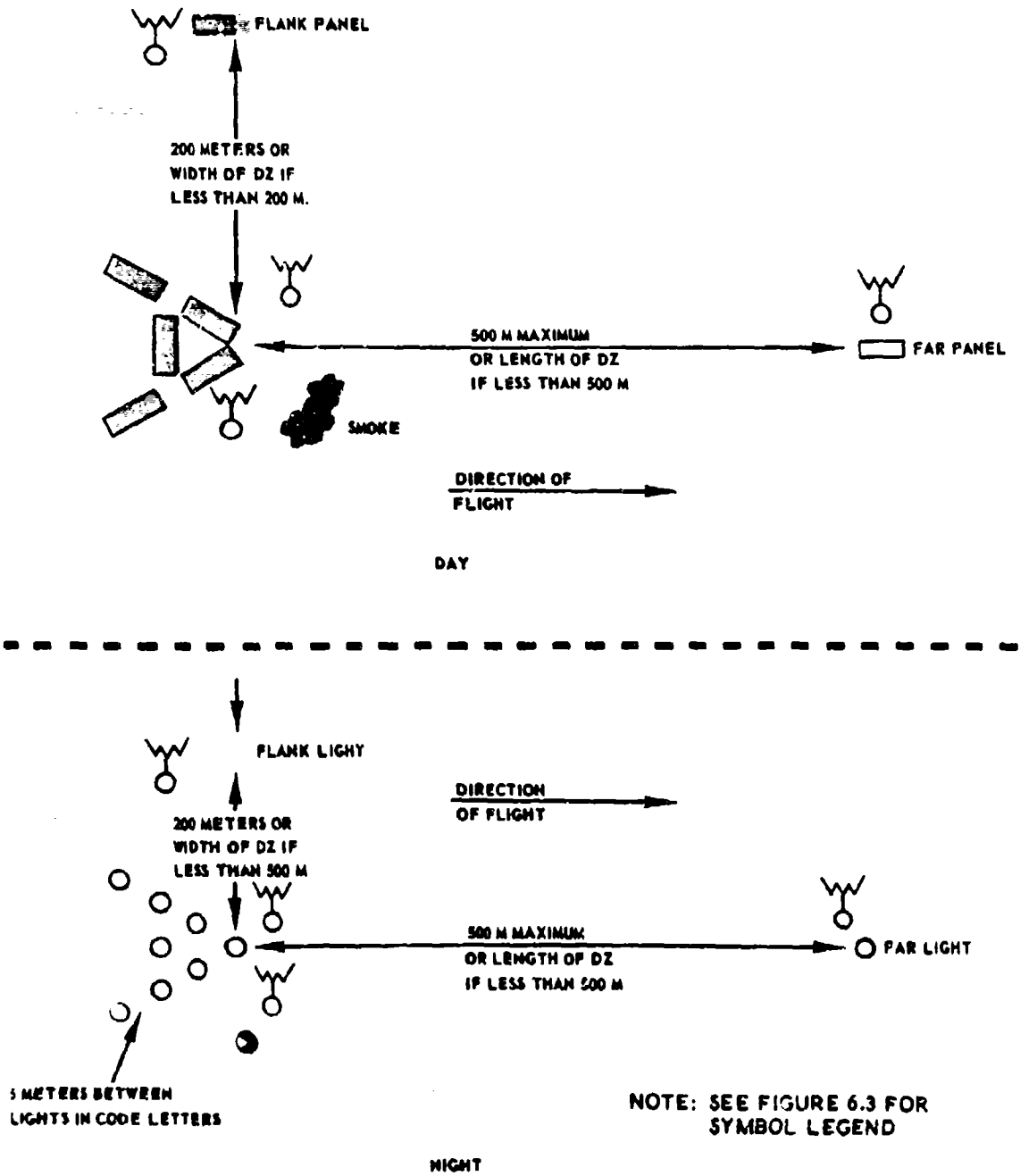


Figure 6.9. Day and Night Drop Zone.

SECTION VII

OPERATION OF A LOW LEVEL EXTRACTION ZONE

6. 30 GENERAL. A low-level extraction (LOLEX) zone is an area where palletized material can be delivered from FW aircraft at an altitude of 10 feet or less by means of an extraction parachute attached to the pallet. A LOLEX zone may contain one or more LOLEX sites.

6. 31 CAPABILITIES, ORGANIZATION AND DUTIES.

a. Capabilities. A pathfinder section has the capability of operating three LOLEX zones simultaneously. When more than one site is being operated within a single LOLEX zone, an RP should be established to facilitate air traffic control.

b. Organization and Duties. The pathfinder section is organized to provide a control center and a marking party for each LOLEX site. The marking party removes and/or marks obstacles as necessary and places the panels on the LOLEX site for the execution point and the line of flight (Figure 6. 10) under the supervision of the pathfinder site commander.

6. 32 SELECTION OF A LOLEX SITE.

a. A LOLEX site is located where it can best support the ground tactical plan. Factors to be considered in its selection are the:

(1) Type of aircraft to be used (normally CV-2).

(2) Type and weight of loads to be delivered.

(3) Type of extraction chute to be used.

(4) Number of unremovable obstacles in the area.

(5) Availability of adequate aircraft approach and departure routes in the immediate area of the site.

(6) Required length and width of extraction area.

(7) Access to the area.

(8) Personnel and facilities available for clearing delivered pallets from the site.

(9) Enemy situation.

b. The required length of a LOLEX site should be coordinated with the supporting aviation commander. Normally, 175-200 meters from the point of execution is required to complete delivery of a pallet at 90 knots drop speed. The site should be alined to execute the extraction into the wind.

6. 35 OPERATION OF A LOLEX SITE.

a. Guidance instructions and air traffic control procedures are practically identical for LOLEX and paradrop operations. The main differences are that the delivery aircraft must be checked to insure that landing gear is down and locked, and vertical steering commands are used as required to bring the aircraft cargo compartment to within the required 5-10 feet above the ground for correct delivery.

b. If facilities or personnel are not available to remove pallets from the delivery area between passes, the control center will adjust subsequent aircraft approaches to insure that low passes and extractions are not made over previously delivered pallets.

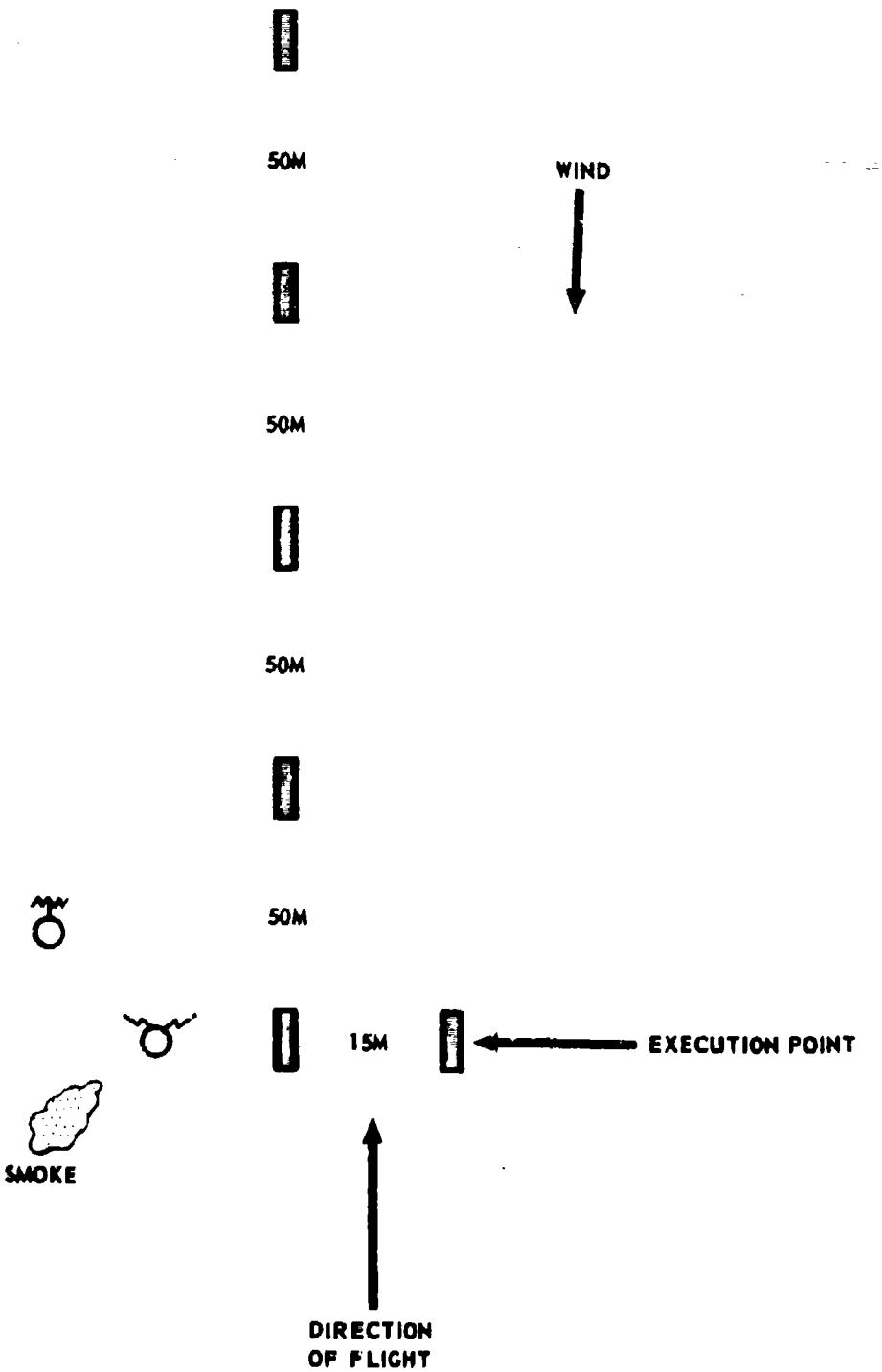


Figure 6.10. Day Low Level Extraction (LOLEX) Site.

CHAPTER 7

TACTICAL OPERATIONS AND PLANNING

CHAPTER 7

TACTICAL OPERATIONS AND PLANNING

7.1 INTRODUCTION.

a. The tactical employment of forces using aerial vehicles to maneuver units, to transport combat support means, and to provide necessary administrative and logistical support, does not alter the requirement for the airmobile force (AMF) commander to properly apply the Principles of War and other fundamental precepts associated with ground tactical operations. The airmobile force is free of the restrictions imposed by terrain obstacles; it may by-pass enemy resistance; it can control vast areas. The AMF commander can rapidly assemble his forces from widely separated locations and mass at the decisive time and place; he can then quickly either redeploy these forces to a new objective area or to dispersed locations. The improved mobility provided by aerial vehicles provides the AMF Commander a new dimension with which to gain and maintain a decisive tactical advantage over the enemy.

b. Section I, Tactical Operations, describes the application of recognized tactical fundamentals and techniques to airmobile operations. Subsequent sections of Chapter 7 concern themselves with the detailed planning associated with airmobile operations. Section II through Section V are arranged chronologically to parallel the reverse planning sequence employed for airmobile operations.

SECTION I

TACTICAL OPERATIONS

7.2 AIRMOBILE FORCES IN OFFENSIVE OPERATIONS.

a. The purpose of offensive operations is not altered by the addition of airmobile resources.

b. An airmobile infantry force is still likely to be assigned a mission of seizing terrain objectives which will materially assist in destroying the enemy force. The airmobile force is ideally suited for rapid offensive operations against guerrilla forces.

c. The fundamentals of offensive tactics remain the same for airmobile forces as for ground forces.

(1) Gain and Maintain Contact. Airmobile forces can gain contact with the enemy; have an improved capability to maintain contact to prevent surprise and to obtain information which facilitates future operations. Once gained, contact with the enemy may be maintained by aerial observation.

(2) Develop the Situation. Airmobile forces are particularly suitable to determine the strength, location, composition, and disposition of an enemy that has been encountered and to conduct rapid reconnaissance to develop the situation.

(3) Exploit Known Enemy Weakness. Like other combat elements, the airmobile force commander must avoid enemy strength and react with maximum speed and combat power to take advantage of known enemy weakness. Enemy weakness can be rapidly exploited through the application of airmobility.

(4) Seize or Control Key Terrain. The ability to maneuver by air reduces the importance of seizing intermediate terrain features, to enhance maneuver or to provide routes to the final objective. Airmobile forces seek to control only those terrain features which may be exploited in destroying the enemy, or in the accomplishment of the mission.

(5) Retain the Initiative. Bold and aggressive employment of overwhelming combat power, the achievement of surprise, or the exploitation of enemy errors or weaknesses serve to gain or retain the initiative. Airmobile forces are well suited for this role and especially in obtaining surprise by choosing an unexpected time, place, direction, type, or strength of attack. Air mobility enhances deception and maneuver.

(6) Neutralize Enemy Capability to React. Every effort is made to disrupt and neutralize the enemy's capability to react to the commander's tactical dispositions and maneuver. Isolation of the battle field and destruction or interference with his reinforcement actions reduce the enemy's responsiveness, enhance the security of the friendly forces, and assist in gaining and retaining the initiative.

(7) Advance by Fire and Maneuver. Airmobile forces are better suited for the role of the maneuvering force, to close with and destroy the enemy with fire and shock effect. They can, nevertheless, be employed as the base-of-fire force to minimize the enemy's capability to interfere with the movement of the maneuver force and, within its capabilities, to neutralize or destroy the enemy.

(8) Maintain the Momentum of the Attack. Once the airmobile assault is launched, every effort is made to gain and maintain momentum until the objective is secured; flexibility and speed in the employment of combat power are paramount. The airmobile force commander attempts to seize the objective in the shortest possible time and he has the means at his command to retain pressure on the enemy. He denys him respite from battle, the ability to execute an orderly withdrawal, and the opportunity to recoup losses, or the opportunity to gain the initiative.

(9) Concentrate Superior Combat Power at the Decisive Time and Place. Successful offensive action requires the massing of superior combat power at the decisive place and time and the rapid application of this power to destroy the enemy. The mobility of an airmobile infantry battalion allows the commander to rapidly move his maneuver elements to obtain the desired mass at the desired time.

(10) Exploit Success. Because combat power is relative, commanders on their initiative seek to take advantage of any information, tactical success, or advantage occurring during the attack. Speed in the application of reserve combat power is required, and airmobile forces possess this capability. The most decisive results are obtained when strong, airmobile forces are committed to exploitation deep in the enemy rear.

(11) Provide for the Security and Integrity of the Force. Security is always necessary. All units are responsible for their security, except when airborne, regardless of the security provided by other units. Airmobile forces can provide security by early detection of the threat; sufficient time and maneuver to react to the threat; and avoidance, neutralization, or destruction of the threat. Integrity involves maintaining the command as an effective fighting force. The airmobile commander ensures that his forces are not divided so that they may be defeated in detail and that essential support is available to his force.

d. In offensive operations, three tasks must be performed: locating and holding the enemy in position; maneuvering against him to gain a tactical advantage; and, at the decisive time and place, delivering an overwhelming attack which destroys him. In order to accomplish these tasks five offensive operations have evolved: the movement to contact, reconnaissance in force, coordinated attack, exploitation, and pursuit.

(1) Movement to Contact. Movement to contact is a tactical operation to gain initial contact with the enemy or to regain lost contact. It may take the form of an airmobile assault conducted to place troops in an advantageous position to engage the enemy. It may take the form of an administrative flight when contact with the enemy is remote or a tactical nap-of-the-earth flight when contact is probable. A battalion may begin a movement to contact employing an administrative flight from a location well to the rear. Upon departing the administrative landing site and prior to entering the rear of the anticipated battle area, the airmobile force adopts a tactical flight. Troops are grouped tactically to facilitate prompt deployment, and security measures are conducted by troops not participating in the airmobile operation. Finally, as direct contact with the enemy becomes imminent, selected units of the airmobile force assault into selected LZ's and adopt the approach march formation as required with elements fully or partially deployed.

(2) Reconnaissance in Force. The most rapid means of developing a situation is the reconnaissance in force. An airmobile force is ideally suited for this mission because of its mobility. In terms of combat power required, it is an expensive method of gaining intelligence. In determining whether to employ airmobile forces to reconnoiter in force, the commander considers the extent of his present knowledge of the enemy situation and the urgency and importance of the additional information sought, the efficiency and speed of other collection agencies, the extent to which his overall plan of action may be divulged by the employment of the airmobile force, and the risk that the reconnaissance may lead to a general engagement under unfavorable conditions.

(3) Coordinated Attack. The employment of airmobile forces in coordinated attacks must be planned in detail and undertaken after thorough aerial reconnaissance, methodical evaluation of relative combat power, acquisition and development of targets, and an analysis of all other factors affecting the situation. It requires the use of a combined arms force consisting of a maneuver element (usually air cavalry and infantry), a fire support element (air, artillery and organic mortars as the base of fire), and all other available combat support (engineers, etc.), with mobility equal to that of the maneuver force.

(4) Exploitation. The exploitation usually follows a successful penetration or envelopment. Its purpose is to destroy the enemy's ability to reconstitute and conduct an organized defense. While individual local exploitations may appear insignificant, their cumulative effects may be decisive. The exploitation usually is initiated when the enemy force is having recognizable difficulty in maintaining his position. Since the exploitation is characterized by rapid movement, the airmobile force is ideal for participating in this type operation. Airmobile forces may be profitably used in conjunction with armored forces during the exploitation to seize key terrain or blocking enemy withdrawal routes.

(5) Pursuit. The pursuit is an offensive action against a retreating enemy force. It may consist entirely of direct pressure forces that are normally not airmobile or it may require the employment of a direct pressure force in combination with an encircling force in which it is desirable to employ a highly ground mobile or airmobile encircling force. Airmobility in this offensive operation is a highly desirable asset to the commander.

e. When an airmobile operation will not be followed by a build up or linkup operation, plans are made to disengage and withdraw airmobile forces when they have accomplished their mission and before the enemy in the objective area is reinforced beyond the capability of the friendly forces to maintain tactical superiority. Because of the streamlining of the AMF to accomplish its primary mission, and the reduced staying power of the airmobile forces, and because of the faster tempo of airmobile operations, the duration of any one operation is normally shorter than other ground actions. Therefore, the AMF Commander continuously prepares for subsequent employment and plans accordingly. Consolidation on objectives should include improvement of existing LZ/PZs.

7.3 AIRMOBILE FORCES IN DEFENSIVE OPERATION.

a. The purposes of defensive and retrograde operations are not altered by the addition of airmobile resources. Additionally, an airmobile force in a defensive posture conducts itself as would any light infantry force.

b. Army aviation may be employed in defensive operations to enhance the ability of the supported unit to:

(1) Repel an enemy penetration.

(2) Disperse to the maximum and yet be capable of massing rapidly.

(3) React to an enemy airborne threat.

(4) Economize forces in one area in order to apply decisive force elsewhere.

(5) Reduce the enemy's capability for offensive operations by conducting airmobile raids or spoiling attacks in the enemy's rear.

(6) Rapidly execute offensive operations to exploit enemy weakness.

c. Fundamentals of Defense. Airmobile resources enhance the application of the fundamentals of the defense.

(1) Proper Use of Terrain. Through the employment of highly mobile forces, maximum defense of key terrain features can be greatly enhanced, particularly when friendly forces must defend on wide frontages.

(2) Security. Small airmobile forces, such as the air cavalry troop, can be effectively employed on security missions. Armed helicopters are ideally suited for such security missions.

(3) Mutual Support. Mutual support is possible within airmobile forces by airlift of units not in contact to reinforce units under attack. This makes mutual support possible even when organic weapons ranges are exceeded, however, caution must be taken at battalion level that dispersion is not too great, or defeat in detail will be likely.

(4) All-Round Defense. Airmobile forces, due to their superior mobility are particularly well suited to react to enemy threats from any direction, including aerial attack. The ability to reposition an airmobile force rapidly to block an enemy threat is a distinct asset. The perimeter defense, a classic example of the all-round defense, is conducted by an AMF in the same manner as any conventional force would conduct a perimeter defense. Airmobile reserves increase the strength at the perimeter.

(5) Defense in Depth. The AMF positions its elements as any conventional force for defense in depth, but has the additional flexibility of rapidly adjusting its posture to meet developing situations.

(6) Maximum Use of Offensive Action. Aggressive patrolling, raids, spoiling attacks, and counterattacks are among the means by which the offensive spirit is readily maintained by an AMF. The AMF must be alert to regain the initiative by offensive action, and it must take maximum advantage of the mobility afforded by supporting aircraft. Counterattack plans are prepared to destroy or eject the enemy if he penetrates the battle area. Frequently, an AMF will be employed to seal off an enemy penetration, while ground mobile forces eject or destroy the enemy.

(7) Time Available. The aircraft supporting an AMF will permit maximum use of the time available by reducing time requirements for the positioning of troops and equipment.

(8) Integration and Coordination of Defensive Measures. The overall defensive plan involves careful integration and coordination of the following plans:

(a) Planned Fires. Planned fires insure the integration of armed helicopters, aerial rocket artillery, and tube artillery to be rapidly repositioned to meet changing requirements. Close coordination between armed helicopters, high-performance aircraft and artillery is essential. Flight routes of friendly maneuver elements must be carefully coordinated, as well, to insure adequate troop safety.

(b) Obstacles. Barriers in support of airmobile operations are employed in the same manner as for non-airmobile operations. However, airmobile resources are not normally used in obstacle preparation, except for the movement of materials and personnel to construct obstacles. Because of the bulk and weight of barrier materials, an AMF can expect a severe degradation of its support pertaining to barrier construction due to transport limitations. Helicopters operating in the vicinity of booby-trapped or mined areas must be careful that the rotor wash of a hovering or landing helicopter does not detonate these devices.

(c) Anti-tank Defense. (Anti-mechanized Defense). Airmobile forces are not particularly well suited for defense against tanks and mechanized forces. Armed helicopters can offer nominal assistance to other anti-tank efforts. Separation of the enemy armor from accompanying infantry should be the first step in the defeat of mechanized forces.

(9) Flexibility. The AMF success in defense is keyed to its ability to react rapidly through its superior mobility. Rapid exploitation of detected enemy weaknesses is greatly enhanced through violent airmobile action.

(10) Dispersion. The ability to mass an airmobile force rapidly permits a greater degree of dispersion than would otherwise be possible.

d. Forms of Defense. The two basic forms of defense are the area defense and the mobile defense.

(1) The area defense may be conducted at all levels of command and is oriented toward the retention of terrain. Because the staying power of an airmobile force is limited, proper and timely employment of airmobile reserves to counterattack is necessary. The airmobile capability of an AMF permits rapid positioning for repositioning of reserves, as well as forward units, to react to any enemy successes that might develop.

(2) The mobile defense is conducted by division and higher levels of command and is oriented toward the destruction of enemy forces that have been permitted to enter preplanned penetrations. The forward defense forces conduct an area defense or retrograde operations as required to canalize and contain the attacker. This creates the conditions necessary to allow the heavy reserve force to counterattack and destroy the enemy in the contained penetration. An AMF as a battalion or brigade size element of the forward defense echelon, participating in mobile defense, is well suited to conduct the retrograde portions of this type defense, by rapidly repositioning itself as the enemy penetration develops. The counterattack by an airmobile reserve must have adequate resources to overcome the enemy mechanized/tank threat. The rapid airmobile reaction capability of the reserve to seal off the penetration or to launch a counterattack through the forward forces enhances the commander's capability to precisely execute this delicate operation.

7.4 AIRMOBILE FORCES IN RETROGRADE OPERATIONS.

a. A retrograde operation is a movement to the rear or away from the enemy. It is an operation which may be forced by enemy action or made voluntarily. In either case, decisive engagement must be avoided and the operation must be approved by the higher commander. A retrograde action may be conducted by ground or airmobile forces, or by a combination thereof. One of the great strengths of an airmobile force, in a retrograde action, is the ability to rapidly execute an extraction from contact. The airmobile force is well suited to serve as a covering force for a retrograde operation. The airmobile force can cover the flanks of a withdrawing force, and conduct limited counterattacks or spoiling attacks against an advancing enemy's weakness.

b. Retrograde movements are conducted for one or more of the following purposes:

(1) To harass, exhaust, resist, delay, and inflict punishment on the enemy.

(2) To draw the enemy into an unfavorable situation.

(3) To permit the use of elements of the force elsewhere.

(4) To avoid combat under undesirable conditions.

(5) To gain time and avoid a decisive engagement.

(6) To disengage from combat.

(7) To place the forces involved in a desired position in relationship to other friendly forces.

(8) To shorten lines of communication.

c. There are three forms of retrograde operations:

(1) Withdrawal: An operation in which a deployed force disengages from the enemy. The methods of withdrawal, as with any force, may be voluntary or involuntary.

(a) The involuntary (daylight-type) withdrawal is conducted under enemy pressure and, just as in ground operations, the AMF commander normally employs a covering force to protect the main body of his force until they have disengaged from the enemy.

(b) The voluntary (night-type) withdrawal is conducted without enemy pressure and, just as in ground operations, the AMF commander normally employs detachments left in contact with the enemy (DLIC) to enhance the deception with which the operation is conducted.

(c) The commander of an AMF conducting withdrawal operations has certain considerations peculiar to airmobile operations. The most important of these are:

1. An AMF will displace primarily by air; the AMF commander will employ covering forces to protect the PZs selected for extraction of units.

2. Armed helicopters and air cavalry are admirably suited for employment as covering force units, to assist in the latter phases of extraction and to maintain contact with the enemy after the withdrawal is completed.

3. Local air superiority is a requirement for a successful withdrawal by air, but a small force may be withdrawn without air superiority by taking advantage of darkness or other conditions of poor visibility.

4. Army aircraft are normally employed to move the withdrawing force. Either fixed or rotary wing aircraft may be used based on available facilities.

5. Fire Support. The requirement for supporting fires increases as the forces are withdrawn and the capability to repel the enemy diminishes. Emphasis is placed upon fires from all available fire support agencies, including armed helicopters, artillery, and naval gunfire. In a voluntary withdrawal, if a portion of the perimeter is threatened, a large portion, and in some instances all, of the fire support units may be required to support the detachments left in contact. Aerial rocket artillery support is utilized to the maximum when available. In a voluntary withdrawal, some of each type of supporting weapons to include armed helicopters are left in place, distributed to retain the original pattern of fires which contributes to deception and secrecy. In addition, close air support and protection from enemy air, reconnaissance, and interdiction are required. The FAC frequently will remain with the DLIC. Fire support, to include artillery, armed helicopters, and Tac air, are planned to cover the planned flight routes.

6. Control measures for movement to pick-up zones are generally the same as those taken for movement to assembly areas during voluntary and involuntary withdrawals conducted by ground forces.

7. Loading. Withdrawing forces must emphasize speed and provide for maximum coordination between the arrival of units in PZ's and the arrival, loading, and departure of aircraft. Aircraft on the ground for an excessive period invite destruction and subsequent failure of the operation. Routine loading instructions are included in the unit SOP. The amount of detail included in the plan is determined by the size of the operation, experience of personnel, and the time available. The following will be included as a minimum:

   a. Schedule and priorities for loading.

   b. Designation of PZ's.

   c. Designation of, and instructions for loading control personnel.

   d. Schedule for movement of units to PZ's.

8. Pick-up Zones. PZ's should be selected as close to unit battle positions as the terrain and enemy situation will permit. To achieve maximum speed in the landing, loading, and take-off, and to provide passive protection against mass destruction weapons, multiple pick-up zones are desirable consistant with available security forces. Factors to be considered in selecting the number and location of PZ's include:

   a. Landing requirements for the types of aircraft to be used.

b. Number of aircraft and rate of landing.

c. Availability of facilities for improving landing areas.

d. Availability of aircraft control facilities.

e. Availability of dispersed PZ's.

f. Protection from enemy observation and fires.

9. Loading Control Group (See Appendix 1 Pg 8). A PZ Loading Control Group may be designated for each pick-up zone used for battalion size and larger unit moves, to expedite loading. Liaison is maintained between the LCGO and the aviation LNO to maintain a balance between the arrival of troops and aircraft in the pick-up zone. When separate company PZ's are utilized this control is provided by the company commander.

10. Air Movement Control. The air movement control required to insure precision timing and minimum delay in the withdrawal depends upon the number of aircraft involved, landing facilities, and visibility. When the AMF is operating as part of a larger force, control facilities are established by higher headquarters. The minimum acceptable control is air-to-ground contact with the unit being transported.

(d) The following considerations are pertinent to the conduct of the withdrawal by an airmobile force:

1. Elements of the main body will withdraw and assemble at the latest practicable time before their scheduled arrival in the pick-up zone. They will withdraw along prescribed routes or in zones as directed. Supporting units and weapons are normally attached, during the withdrawal, to the unit in whose area they were employed. Support troops and units least engaged are withdrawn first, and the most heavily engaged units last. Airmobile reserves may be employed to counterattack to assist in this disengagement.

2. On arrival in the PZ, units complete preparation for loading and form into plane-load groups conforming to unit integrity if possible. These groups move to the pick-up zone when summoned by the LCGO. It may be necessary to sacrifice tactical loading for speed and maximum use of the aircraft capacity.

3. Supporting fires, air support, mines, and obstacles are fully exploited to prevent the enemy from pursuing the withdrawing force. Smoke may be used to obscure enemy observation, as long as it will not interfere with aviation operations.

4. During a voluntary (night-type) withdrawal, emphasis is placed on secrecy and the simulation of normal activity as long as possible.

5. Detachments left in contact assume control of their respective areas when the main body begins its withdrawal. After the main body completes its withdrawal or at a predesignated time, the DLIC will break contact and move to a designated pick-up zone under cover of armed helicopters, close air and other fire support. These pick-up zones for the detachments left in contact must be as close as practicable to their battle positions.

(2) Delaying Action. An operation in which a committed force trades space for time while inflicting maximum punishment on the enemy without becoming decisively engaged.

(a) In the delay the commander plans to control his movement to the rear by the use of delay positions and planned withdrawals between delay positions. He will employ covering forces to maintain contact with the enemy and insure continuous delay.

(b) Airmobile forces are particularly well suited to conduct delaying actions or to participate in the delay, as a part of a larger force. When employed together with other forces, the airmobile force should be used to exploit its tremendous mobility. Highly mobile forces are particularly well suited for security and covering force missions.

(c) The AMF may conduct limited attacks or raids on enemy rear areas or counterattacks to relieve units under attack.

(3) Retirement. An operation in which forces not in contact move away from the enemy according to their own plan and without direct pressure.

(a) A retirement may be made to increase the distance between the defender and the enemy, to occupy more favorable terrain, to reduce combat service support distance, to conform to the dispositions of a larger command, or to permit employment in another sector.

(b) An AMF usually executes a retirement as part of a larger force. When it is on an independent mission, the AMF retires in compliance with specific instructions or after completing its mission.

(c) A withdrawal may precede a retirement; the retirement begins after the main force has disengaged. The considerations for, and the conduct of, retirement by airmobile forces are the same as for airmobility behind friendly lines.

(4) Stay-behind Forces. During a retrograde movement, airmobile forces may be ordered to let enemy forces bypass them to enable the friendly elements to operate in the role of stay-behind forces. Such operations require detailed planning, carefully delineated missions, and a high degree of control. Airmobile forces are particularly suited for such missions because they have the capability for long-range communications, and can quickly be withdrawn by air at the completion of the mission.

7.5 AIRMOBILE FORCES IN NIGHT OPERATIONS.

a. General. The overall success of any force may well depend upon its ability to fight at night. Offensive airmobile actions at night and under conditions of reduced visibility may often achieve success where a daylight operation would be impractical. Darkness increases problems of control, movement, and navigation of the ground units as well as the aviation units. Through detailed planning, night operations may be executed to give the AMF a tactical and psychological advantage over the enemy.

(1) There are two types of night airmobile attacks: illuminated and nonilluminated. Normally, the airmobile force conducts the illuminated attack; however, the particular method employed depends on such tactical considerations as the enemy strength and degree of preparation of his positions, his security measures, and terrain and light conditions. The nonilluminated attack is made to maintain secrecy and achieve surprise and requires the LZ to be hidden from the objective. The illuminated attack is made when the enemy position is strong, when the possibility of achieving surprise is remote, when control requires use of daylight control methods, and terrain and light conditions dictate.

(2) When illuminating means are used to provide light approximating that of daylight, and such employment is feasible and comtemplated throughout the attack, the techniques involved are the same as for a daylight attack. Surprise may be obtained by withholding illumination until the landing phase. Used at such time, direct illumination may serve to blind the enemy. Care must be exercised not to blind the aviators. US Air Force and Army flare aircraft should be on station for immediate employment. Search light helicopters (Lightning Bug, see Glossary) may be used and assigned additional missions to include but not limited to illuminated aerial reconnaissance, illumination of enemy targets, illumination of the LZ and illumination demonstrations.

b. Planning the Night Airmobile Attack. The techniques for planning a night airmobile operation are similar to those of a daylight operation; however, night operations require increased emphasis in the areas indicated below:

(1) Night operations require day and night reconnaissance. Day reconnaissance is necessary to provide the AMF and mission commanders, and their staff, with a knowledge of the terrain with which they are concerned. Night reconnaissance should be considered at the same time and under similar conditions (light) as anticipated for the actual operation. Control points tentatively selected during day light must be verified to determine if they are visible from planned altitude at night. Time, distance, and headings between control points should be checked. Night appearance of the LZ should be observed, and its characteristics noted.

(2) Pathfinders are used to provide highly essential services at the loading zone and enroute to the LZ as well as terminal guidance at the LZ. These services are provided through use of obstruction lights, glide slope lights, landing lights, non-directional beacons, radio voice control, and light guns. (See Chapter 6). Infiltrators (a combined security and pathfinder force) may be used to light the LZ. However, infiltrators if detected, may alert the opposing force to the impending operation.

(3) Loading zones and LZs should be larger than in daylight to facilitate the night operations. Loading zones and landing zones to support night operations must be selected with greater emphasis on their acceptability from an aviation standpoint.

(4) Positive, detailed, aircraft control must be used throughout the operation. Flight crews must be thoroughly familiar with control procedures, and no deviation can be permitted except in an emergency.

(5) Enemy fire is not as effective at night, but tracer fire should be treated as a psychological matter in troop training for night airmobile operations.

(6) Time patterns are avoided so that the enemy cannot predict the time of attack. An attack may be made late at night so that initial objectives can be organized by daylight and the attack continued at that time. If the objective is relatively deep, or if the AMF mission requires immediate continuation of the attack, the attack may begin early at night. If the objective is to be seized and held, the attack may begin early at night with the consolidation of the objective phase taking place during darkness. Noise and light must be carefully controlled. Deception measures may include feints, illumination demonstrations or artillery fires to cover the noise of aircraft.

(7) Good weather conditions are required to permit night flying at altitudes that will give positive terrain clearance and visibility to at least three miles. Areas heavy with dust must be avoided in night operations.

(8) Successful night airmobile operations may be impromptu; however, the risk of failure is greater than during daylight attacks. Detailed planning is normally required. Whenever practicable, a rehearsal is conducted during similar conditions of darkness.

(9) In an airmobile operation, conducted at night, the following additional factors are of greater importance:

(a) Time for planning and preparation.

(b) Information of terrain, enemy, and expected weather conditions.

(c) Necessity for secrecy and surprise.

(d) Orders and simple schemes of maneuver.

(e) Easily recognized objectives.

(f) Night-indoctrinated flight crews, troops and leaders.

(g) Requirements for control.

(h) Time required for logistical support functions.

(i) Thorough planning for consolidation of the objective or for continuing the attack.

c. Night Fire Support Planning.

(1) Accurate air to ground fire at night without illumination, is very difficult. Target illumination may be provided by Lightning Bug aircraft or illuminating flares from mortars, artillery, or Air Force/Army aircraft.

(2) Artillery should be used more extensively at night to compensate for the reduced effectiveness of aerial firepower.

(3) Fire support elements must rely on prearranged communications and visual signals, known to be effective at night, to identify friendly troop locations.

d. Night Control Measures. The following control measures are appropriate for night airmobile operations:

(1) The LZ's will be lit by pathfinders or unit terminal guidance personnel after introduction into the LZ with the initial assault echelon. The normal method is to use marking lights or flares dropped by aircraft. It is possible to airland, at night, using only flashlights, or the landing light mounted in the assault helicopter; however, an AMF normally would only use either of these methods for security force, or for the personnel to prepare the night LZ for arrival of the remainder of the battalion.

(2) Special control measures include: Means for identifying friendly troops, signals used for recognition or other purposes, special means for helping to navigate the airmobile column such as vectoring by radar, or white phosphorus mortar or artillery rounds.

e. Operational Techniques.

(1) Aviator training will overcome most aviation difficulties encountered during night operations.

(2) Fueling, arming, preflight and similar aircraft preparation should be completed during daylight if possible.

(3) Line up of the aircraft in the loading zone should be completed during daylight.

(4) Adverse weather should be avoided during night operations; however, aviators must be trained to maintain their formation position if it is encountered. Clouds will be avoided. If there is doubt about weather clearance the aviation commander sends a "weather" helicopter ahead to insure that the flight route is possible.

7.6 AIRMOBILE FORCE IN LINKUP OPERATIONS.

a. General. A linkup involves the juncture of two units on the ground. The AMF will normally participate in linkup operations as a part of a larger force; it may conduct linkup operations within its own resources. Aviation resources are generally not employed directly in a linkup operation. Linkup must be planned for any airmobile operation in event withdrawal by air is not feasible.

b. Planning for Linkup. Planning for linkup must insure close coordination of the efforts of the linkup force and the stationary force with which linkup is made. Plans are prepared and coordinated in advance and include the following:

(1) The command relationship of forces involved in a linkup operation must be clearly deleniated prior to the operation. The "stationary" force may be attached to the linkup or vice versa. Similarly, both forces may come or remain under control of a higher commander. The headquarters directing the linkup establishes the command relationship, including the time or conditions under which the command relationship will be effective.

(2) Command and staff liaison is a continuing responsibility before and during the operation. Coordination and exchange of plans is accomplished early in the planning phase. As linkup becomes imminent, additional liaison personnel may be exchanged to insure coordination of fires and changes in tactical plans.

(3) A system of mutual recognition is devised to preclude the possibility of friendly troops firing on one another.

(4) Communications plans are coordinated to include establishment of nets and exchange of call signs, authentication procedures, radio frequencies, and SOI and SSI extracts. Army aircraft are used in a radio relay role as required.

(5) Schemes of maneuver are exchanged to include current and planned locations of friendly elements. Control measures are established in advance to include linkup points, boundaries, axes of advance, and objectives, as appropriate. Easily recognizable linkup points are selected for physical contact between the two forces. Sufficient linkup points are established to accommodate possible changes in the scheme of maneuver. Checkpoints and phase lines also may be used to determine by reference the location of one or both forces and thereby facilitate control.

(6) Control of fires is accomplished by exchange of fire support plans and by coordination of control measures.

(7) Obstacles are removed, where appropriate, immediately prior to linkup, and lanes through barriers are opened to facilitate linkup and reduce the time of passage through positions of the stationary force. Guides provided by the stationary force assist in traffic control. The linkup force must be fully informed of all minefields and other obstacles in front of and within the position.

(8) Alternate plans are developed in view of the possibility that the linkup force may be unable to reach the stationary force in the prescribed time. Provisions should be made for fire support, close air support, and aerial resupply for the stationary force for such a contingency.

SECTION II

GROUND TACTICAL PLAN

7.7 GENERAL.

a. All planning and execution of an airmobile operation depends on the AMF commander's ground tactical plan. This plan must be completed before the other plans can be formulated since it serves as the basis for the remaining plans. Each plan supports the succeeding plan. This then is the reason behind the inverse planning sequence and the chronological order that begins with the preparation of the ground tactical plan.

b. To achieve maximum planning effectiveness, the supporting aviation commander or his representative must participate throughout the planning phase as consultants on all matters that pertain to aviation employment.

c. The ground tactical plan includes the airmobile assault plan to seize the objective, and the defensive, linkup or withdrawal by air, fire support, and subsequent operations plans. Alternate plans are prepared to include plans in event the airmobile operation is precluded.

7.8 DEVELOPMENT OF THE GROUND TACTICAL PLAN. The ground tactical plan is developed based on the fundamentals of offensive, defensive, or retrograde operations. (See Section I.). The unique characteristics of airmobile operations require that special consideration be accorded the following areas of planning.

a. Objective Area. The objective area, often referred to as the "airhead", contains the objectives necessary to accomplish the mission and sufficient terrain area to allow for defense of the objective area.

(1) The assignment of objectives is normally controlled by the headquarters directing the airmobile operation. When the objective is not specifically delineated by higher headquarters, the AMF commander determines his objective by mission analysis. Objectives may be terrain oriented or a specific enemy force.

(2) The assignment of intermediate objectives is not normal in airmobile operations and is done only to insure mission accomplishment. Intermediate objectives may slow down an airmobile operation and should be used only to enhance achieving surprise by the AMF. Normally airmobile objectives are deep; however, close-in objectives may be assigned when enemy or atmospheric conditions prohibit the use of helicopters to assault deep objectives.

b. The Reserve.

(1) General. In the attack, the AMF retains a reserve to enter combat offensively at a decisive time and place to exploit success and complete the accomplishment of the mission. The AMF reserve may be employed to:

(a) Exploit success.

(b) Maintain or increase the momentum of the assault.

(c) Hold ground seized by the assault force.

(d) Defeat or block enemy counterattacks.

(e) Provide security.

(2) Size of Reserve. The AMF reserve is usually small due primarily to the improved mobility and resulting rapidity with which it may be employed as well as the need for the bulk of the AMF to be employed to seize airhead objectives. The size of the reserve is ultimately determined by an analysis of the factors of METT. Limited knowledge of the enemy situation or inability to visualize the attack to its final objective requires the retention of a stronger reserve than in situations where these conditions are known.

(3) Location of the Reserve. Dispersal of reserve units into multiple assembly areas provides protection from enemy attack. Consideration is given to locations that facilitate rapid movement to points of probable employment. Reserves may be located outside the airhead if deemed appropriate.

(4) Movement of the Reserve. The reserve should be positioned for rapid employment and should displace when required to remain within supporting distance of the committed forces.

(5) Reconstitution of Reserve. Plans should be made prior to the assault to reconstitute a reserve at the earliest opportunity after the reserve is committed.

c. Organization for Combat.

(1) General. The same factors are considered in determining the AMF organization for combat as apply to ground units.

(2) Airmobile. Airmobile forces operate relatively independent of the terrain influences that restrict ground operations. Offensive operations usually are oriented on the location and destruction of enemy forces rather than on the seizure or retention of terrain features. Airmobile operations are characterized by rapid execution and timely extraction by air. A rapid tempo of successive operations is maintained to maintain the initiative and to keep the enemy off balance.

(3) Aviation Support .

(a) Transport. Transportation needs will be determined during the development of the air movement plan which is based on the ground tactical plan (See Section ....)

(b) Fire Support. Armed helicopter requirements will be closely coordinated with other fire support elements such as artillery and tactical air support. (See .....)

(4) Artillery Support.

(a) The supporting artillery for the AMF is assigned that tactical mission or command relationship necessary to provide adequate support and integration in the AMF formation for the attack. The mobility of the supporting artillery must equal that of the assault units in order to remain within supporting range. Artillery may be attached to an airmobile force when operating at distances that preclude effective, centralized artillery control.

(b) See Chapter 4.

(5) Engineer Support. Supporting engineer units should be retained under centralized control whenever possible to provide for unity of engineer effort and maximum use of resources. An engineer company may be attached to a brigade size airmobile force when centralized engineer control is not feasible. Its platoons may be further attached to maneuver battalions when centralized engineer control would be difficult or impractical, such as in the exploitation and pursuit operations.

(6) Logistical Support.

(a) The logistical base is positioned to best support the combat and combat support elements of the AMF and is displaced as required. When an AMF is employed in a semi-independent role, essential medical supply, and maintenance elements from the logistical base may be attached to it.

(b) See Chapter 4, Combat Service Support.

d. Control Measures. The control measures that can be assigned an AMF are identical to those used for ground mobile operations. The key to assignment of control measures, as in other tactical operations, is to use only those measures absolutely necessary to adequately control the operation.

(1) Objectives. Objectives are used to control the airmobile force as necessary but not as a standard requirement particularly when oriented against an enemy force in a counter-guerrilla environment.

(2) Line of Departure (LD). The LD is applicable only to subsequent ground assault operations and does not apply to the airmobile assault phase of the operation.

(3) Time of Attack. The time of attack is called H-Hour in airmobile operations and denotes the time the lead transport helicopter touches down in the landing site.

(a) In selecting the time of attack, consideration is given to orders from higher headquarters and the time required for subordinate units to plan and react to the mission to include movement to the landing zone.

(b) Stereotyping the time of attack should be avoided to enhance surprise and prevent enemy detection of pending airmobile operations. A habitual relationship of time of attack to extensive artillery preparations must be avoided.

(c) It is common for an AMF to be assigned a general time of attack, such as "at once"; "without delay"; "continue"; or "on order".

(4) Boundaries.

(a) The use of boundaries, or zones of actions, in offensive airmobile operations will find application only in the conduct of the ground attack following the airmobile assault. The zones of action assigned will extend outward from the center of the airhead beyond the objective, to the necessary depth to insure coordination of fires and the seizure and control of the unit objective. The zones of action are assigned at the time the ground tactical plan is prepared to prevent any delay of the airmobile assault forces rapid seizure of their objectives upon landing. When zones of action in airmobile operations are to be cleared, it must be so stated in the order.

(b) The use of boundaries, or sectors of responsibilities, in the defense or in retrograde operations is determined by the size and depth of the sector. The assignment of sectors of responsibility implies clearance by the responsible unit.

(c) The assignment of boundaries, ideally, should include adequate landing sites in offensive, defense, and retrograde airmobile operations.

(5) Axis of Advance. An axis of advance arrow is commonly used to portray flight routes.

(6) Direction of Attack. Because of the restrictions imposed by the use of a direction of attack arrow, it is seldom used in airmobile operations, except for positive control during the counterattack and night attack.

(7) Assembly Area.

(a) The assembly area, when used in relation to pending airmobile operations, is influenced by the type of helicopters to be employed and the availability and security of suitable landing sites.

(b) Assembly areas may be so far rearward as to require refueling of aircraft prior to conduct of an air assault. Refueling areas are designated along the routes forward, but should be located beyond the range of enemy light artillery. Final coordination for the attack may be conducted concurrently with the refueling operation. Units then proceed directly to the assault landing zones.

(c) Assembly areas should be concealed from air and ground observation and be large enough to permit adequate dispersion, which will avoid presenting a lucrative target to artillery or air attack. Suitable routes forward should be available. Ground observation and natural protection from tank attack are desirable. Areas should also be beyond the effective range of the bulk of enemy artillery.

(d) Assembly areas may be designated for dispersal of units following the attack.

(8) Attack Position. The airmobile force normally does not use an attack position.

(9) Phase Lines. Phase lines are used frequently to control the movement of airmobile forces. Due to the independent action conducted by the subordinate units the use of phase lines is the minimum control measure assigned.

(10) Air Control Points (ACP's) and Check Points.

(a) ACP's are reference points oriented on specific geographical features to control the direction of flight of the airmobile column.

(b) Checkpoints may be geographical features used to control and facilitate reporting of the unit's movement on the ground.

f. Security Forces.

(1) General.

(a) The AMF makes every effort prior to the assault to prevent the enemy from determining the time and place of the assault. Tactical cover and deception plans normally are not included as part of the AMF's operation order on plan; tactical cover and deception plans from higher headquarters are used.

(b) The air cavalry troop is an ideal force for security roles. During the assault, security may be obtained by:

1. Employment of security forces under AMF control and aerial surveillance means.

2. The disposition of forces.

3. The speed with which the assault is executed.

4. The control of key terrain and the use of fires.

(2) Coverage of Gaps. The AMF normally assaults on a broad front, permitting gaps of considerable size between assaulting units. Responsibility for control of such gaps must be clearly specified by the AMF commander.

(a) Such gaps are controlled primarily by aerial security forces, patrols, continuous aerial surveillance, and by fire, using resources immediately available to the AMF and other resources such as tactical air.

(b) Enemy forces, discovered in these gaps, which are capable of interfering with the accomplishment of the mission are destroyed by fire and by fire and maneuver. Preferably, they are destroyed by fires to avoid commitment of maneuver forces. Those enemy forces not posing a serious threat may be contained by minimum forces until they can be eliminated.

(3) In a perimeter defense, it is usually necessary to economize on the number of security forces. Units along the FEBA are normally given responsibility for providing security within their assigned sectors.

(4) To provide security for airmobile assault during the early stages, security forces normally land directly on their assigned objectives. Air cavalry or other available armed aircraft may be employed to extend the range of security operations.

7.9 ADDITIONAL CONSIDERATIONS. In developing the ground tactical plan, the following characteristics of airmobile operations must be considered:

a. The possibility of immediate engagement after landing, resulting in control difficulties.

b. Possible lack of immediately available artillery support.

c. Greater separation of units, resulting in exposed flanks.

d. The necessity for placing concentrated preparatory fires on the periphery of the landing zone(s) immediately prior to the landing of an assault force.

e. The requirement for expedient deceptive devices designed to mislead the enemy as to the strength and dispositions of the airmobile force.

f. The possibility of shuttling assault forces to the objective area due to limited numbers of available aircraft, or loss of aircraft from unexpected maintenance deficiencies or as a result of enemy action.

g. Increased reliance on close air support.

7.10 ASSAULT PHASE.

a. The infantry assault phase of an airmobile operation begins with the landing of the lead elements and continues through the seizure of the objective area and the occupation of the initial security positions.

b. The fact that an airmobile force usually lands where there are few fixed defenses and few well organized enemy combat troops facilitates rapid seizure of initial objectives. The enemy is expected to react rapidly. Initial counterattacks are likely to be hasty, uncoordinated thrusts along main avenues of approach with any units available. These attacks progressively increase in strength, mass, and coordinated effort and may possibly include counterattacks by enemy airmobile forces.

c. There are two general types of airmobile assaults, which differ primarily in the proximity of the landing zones to the initial objectives assigned to a unit.

(1) The first type involves the simultaneous landing of assault units immediately adjacent to initial objectives; this is the preferred type of assault. Landing zones and landing sites (strips) are selected to capitalize on the ability of small units to land on almost any type of terrain. This type of assault has the following advantages:

(a) Surprise is exploited by attacking and seizing initial objectives and vital installations before defending forces can react.

(b) Assault units avoid the exhaustion resulting from forced marches, carrying heavy combat loads, and manhandling equipment over long distances.

(c) Greater initial dispersion makes the force less vulnerable to nuclear weapons.

(2) The second type of assault involves landing, assembling, and reorganizing, prior to attacking to seize initial objectives. This type of assault is used if the terrain and enemy situation do not permit landing on, or immediately adjacent to, initial objectives. Landing zones and landing sites are selected with more emphasis on their suitability for landing, assembling, and reorganizing larger units without enemy interference. This type assault has these advantages:

(a) Loading, movement, and landing are simplified by the movement of major units to landing zones intact.

(b) Landing in an undefended zone reduces losses of aircraft and personnel during the landing phase.

(c) Coordinated action is facilitated by establishing control of small units before engaging the enemy in ground combat.

(d) Less time is required to train and rehearse troops for this type of assault since it most nearly resembles conventional ground combat.

(e) More protection is provided to supporting weapons, command posts, and logistical installations in the vicinity of the landing zones.

(f) Fire support from outside the objective area is more easily coordinated with ground maneuver.

(3) A variety of factors influence the selection of the type of assault. These include the mission, the state of training of participating units, the terrain, the strength and disposition of enemy forces, and the capability of either side to employ nuclear weapons.

d. The mission and the requirement for depth of defense may dictate the assignment of wide frontages to combat elements of the force. However, airmobile units lack ground mobility

because of the limited amount of equipment accompanying them in an assault. The lack of tanks and motor vehicles reduces the capability to conduct sustained offensive and defensive operations. This deficiency in ground mobility is partially balanced by shorter lines of communication within the objective area and by the use of Army aircraft to move reserves, supplies, and equipment.

e. The reduced artillery support is partially overcome by the use of long-range artillery, naval gunfire, use of armed aircraft, and close air support. An additional advantage is the enemy's difficulty concentrating effective fires on hostile formations suddenly placed in unexpected areas.

f. Airmobile forces may have to be extracted under heavy enemy pressure. Fire support plans and movement plans should consider this possibility, and the ground tactical plan should anticipate this contingency.

7.11 MISSION ACCOMPLISHMENT.

a. Coordinated and aggressive action by small units is required to seize assigned objectives rapidly before the advantage of surprise is lost. All available fire support is employed. Units assigned reconnaissance and security missions are positioned in the serial to land early and move out rapidly, or to land in proximity to their assigned positions, to establish roadblocks, locate enemy forces, disrupt enemy communication facilities, and provide the airmobile force commander with information, security, and early warning. Once a single airlift serial has landed, the remainder of the force must be committed to reinforce and hold the area. Alternate landing zones will not be used until the forces on the ground are strong enough to protect themselves.

b. As soon as the tactical situation permits, and after communications have been established, the AMF commander will institute centralized control of the operation.

c. The commander places himself where he can personally influence the situation by maneuver of forces and/or allocation of available fire support. Normally, the commander will be in the airborne command helicopter (See Sec I, Chap 2).

7.12 CONSOLIDATION OF THE OBJECTIVE AREA.

a. Once the objective has been secured, the AMF commander will consolidate his position to enhance retention of his advantage. Defensive positions are organized, communications are improved, reserves are reconstituted, and other measures are taken to prepare to repel enemy counterattacks, to minimize the effects of attack by nuclear weapons, or to resume the offensive.

b. The extent to which the objective is occupied and reorganized for defense is determined largely by the mission, enemy capabilities, and defensive characteristics of the terrain. The commander adjusts the preplanned disposition of troops and control facilities to fit the terrain and situation. As additional units are landed in the objective area, positions are reinforced. The forces designated for the COP are frequently air transported directly to their positions relatively early in the operation. Reconnaissance forward of the COP is intensified by air and ground means. Artillery and mortars, properly protected, may be displaced to positions close behind or ahead of the COP to provide fire support to security forces. Roadblocks, minefields, and similar artificial obstacles are continuously improved along all likely avenues of approach.

7.13 DEFENSIVE OF THE OBJECTIVE AREA.

a. Once the consolidation and reorganization of the objective area has been completed the airmobile operation enters the defense phase. The period of time involved may vary from a few hours to a few days depending on the mission assigned, the size and composition of the force, the enemy reaction, and the type of subsequent operation contemplated.

b. In the defense of an objective area the AMF normally employs a perimeter defense, organizing and occupying the dominant terrain to cover main avenues of approach into the position; by covering the interval between positions with patrols, observation posts and listening posts; by taking maximum advantage of artificial and natural obstacles; and by providing a mobile reserve. Enemy attacks are countered by shifting units to reinforce threatened areas, massing all available fire support, and by counterattacking.

c. In a nuclear environment the AMF must organize the defense to provide maximum dispersion consistent with the necessary defensive strength to resist ground attack. The ability of an airmobile force to react rapidly and concentrate quickly, enhances its defensive strength. The defense will be organized and conducted just as any other operation in a nuclear situation. The effectiveness of a successful defense in a dispersed formation can be increased by using nuclear weapons to attack enemy concentrations.

SECTION III

LANDING PLAN

7.14 REQUIREMENTS FOR PLANNING.

a. The landing plan as a minimum, includes the sequence, time, and place of arrival of troops, equipment, and supplies in the objective area. LZ's are selected as close to objectives as the terrain and enemy situation permit. Several units may use the same LZ when available LZ's are insufficient or inadequate.

b. Based on recommendations from the aviation unit commander, the AMF commander designates the LZ's to be used by each subordinate unit, and the priorities for landing. Alternate LZ's should always be designated in event the desired LZ's are unusable from a terrain or enemy activity standpoint. LZ's are not actually selected during the preparation of the ground tactical plan; however, consideration must be given to available LZ's at this time. No one plan can be prepared in a vacuum and of necessity the ground tactical and landing plans are closely interrelated to insure the best possible disposition of LZ's to facilitate seizure of objectives. The important thing to remember in preparing the landing plan is that it must not be finalized until completion of the ground tactical plan and then this plan supports the scheme of maneuver. A unit is normally landed in its assigned sector. If the LZ's in the assigned sector are inadequate, the unit will land in the sector assigned another unit. Selection of several LZ's in each unit sector is desirable. Diversionary landings designed to deceive the enemy may be used, and should be planned. Plans should include provisions for armed helicopters to strike tree lines or possible areas where the enemy could be concealed, immediately prior to landing. Additional tactical factors to be considered are:

(1) Cover and concealment.

(2) Nearness to dominating terrain.

(3) Covered routes of approach to the objective.

(4) Adequacy for defense against armor.

(5) The maximum effective use of all available fire support in LZ's immediately prior to the assault landing. This includes the use of weapons mounted in the transport helicopter doors which can provide suppressive fires during approach.

7.15 TIMING OF THE OPERATION.

a. The timing of the airmobile operation in relation to other operations requires consideration of:

(1) The mission of the airmobile force.

(2) Enemy dispositions and capabilities.

(3) Depth of the operation.

(4) Capability and limitation of fire support.

(5) Predicted weather and light conditions.

(6) Nature of subsequent operations.

b. Units may land at BMNT to take advantage of darkness during air movement and attack in daylight; or it may land at EENT to conceal the air movement and attack during darkness. Airmobile operations conducted during daylight present fewer command and control problems, can be made more complex, and can be better supported by close air support. (See Chapter 2.)

c. The most critical period of the operation occurs between the time the initial landings take place and the time the assault of the objective begins. When assault units land immediately adjacent to their initial objective, the AMF commander must rapidly attain control of his assault elements and retain this control throughout the seizure of the objective. LZ's should be cleared immediately, if necessary, to permit arrival of succeeding lifts. Minimum reorganization takes place in an attack position or enroute to the objective. Aggressive action to seize initial objectives is of primary importance. After objectives are seized, the AMF commander regains centralized control of the AMF. Intensive training, SOPs, and rehearsals will minimize control and reorganization problems in the assault.

d. Landing operations will be accomplished as follows:

(1) Troops land in assigned LZ's.

(2) The rapidity with which units land varies greatly with the type and quantity of aircraft and the capacity of the LZ's. When the assault echelon can be transported in one lift, it may land in a few minutes. If the assault echelon has to be shuttled, a longer time is required. Shuttling of the assault echelon is avoided whenever possible. A simultaneous landing is desired to initially place the maximum number of troops into a given area in the shortest time possible.

(3) The initial lift of the assault echelon must have the necessary combat power to seize and secure the LZ. If pathfinders are not already in the objective area, they land with the initial lift of the assault echelon to provide subsequent LZ control and assistance. Command groups will land with initial lifts when not in a C&C helicopter, to establish control and gain timely information on the progress of the ground action. Forward observers and air control teams normally remain airborne throughout the assault. Supporting weapons are landed when the LZ has been secured and are positioned in the planned firing positions. First priority must go to combat power to secure the LZ.

(4) All individuals and units land with essential weapons, equipment and ammunition to sustain operations until additional equipment and supplies can be delivered in later serials. Airtransportable command and reconnaissance vehicles and weapons that are required for mission accomplishment are landed with the units. Off loading internal loads is time-consuming and slows troop build up, so only sling (external) loads should be programmed in the assault echelon.

(5) Troops and equipment unload quickly and clear the landing sites. This facilitates aircraft traffic flow, reduces danger of accidents, minimizes casualties from enemy fires and counterattack, and allows the aircraft to rapidly clear the LZ. At night, troops hit the ground on disembarking, wait for the helicopters to depart and then rapidly clear the LZ.

(6) Casualties to be evacuated while the buildup is in progress should be moved to an established evacuation site on the periphery of the LZ. Traffic in and out of this site should not interfere with the buildup still in progress.

(7) During the planning stage, the AMF commander and the supporting commander must determine mutually the course of action to be taken in the event the AMF receives effective ground fire just prior to landing. An alternate plan is coordinated with the aviation unit

commander, and authority for aborting the assault landing or diverting to an alternate LZ will be delegated to the appropriate person who will be on the scene. This decision may be made by a person from either the aviation unit or ground force. It may only be necessary for the airmobile force to make a "go-around" while additional fires are placed on the LZ or a decision is made to abort and proceed with an alternate plan. When enemy fire interferes with the landing, preplanned fires are placed on the LZ by all available fire support. If these countermeasures are ineffective, alternate plans must be followed. It is during this phase that the closest coordination between all units must be accomplished.

7.16 LZ/PZ SELECTION CRITERIA

a. One of the great advantages an AMF commander has is the ability to land the assault forces on or near the objective. In order to accomplish this, LZ/PZ's which are not "ideal" from the aviation viewpoint may be selected. Other areas that might be more suitable for helicopter operations will not support the ground tactical plan. Therefore, the less desirable area, from an aviation standpoint, must be used. There are, however, several aviation requirements which must be fulfilled.

(1) Approach and departure routes must be relatively free of obstacles. To determine this, prior aerial command reconnaissance and/or current aerial photograph of tentative LZ/PZ's are used as the situation permits.

(2) There must also be sufficient space for landing (hovering) of helicopters required to place the desired combat power on the LZ in the initial lift.

(3) The surface of the LZ/PZ should support the helicopters and be as free of obstacles as possible.

(4) When a desired LZ/PZ presents a serious hazard the aviation commander will advise the AMF commander. Jointly, the two commanders, who realize that a combat situation will seldom be perfect, will measure the risk against the tactical advantage gained by using a less than desirable LZ/PZ.

b. The selection of LZs and PZs should provide favorable aviation conditions for approach, landing and take off. The AMF commander who selects the LZ/PZ must also consider:

(1) Landing as close as possible to the objective.

(2) Cover and concealment must be carefully analyzed by the AMF S2 because there is always the possibility that the assault force will have to commence the assault immediately upon landing.

(3) The route of approach to the objective is vital when the landing cannot be accomplished on the objective.

(4) Supporting fires in and on the LZ will be analyzed to employ the most effective fire support means available: TAC air, artillery, and armed helicopters.

(5) In planning for any airmobile operation alternate LZ/PZ's are selected, using the same careful selection criteria used to select the primary LZ/PZ's.

c. LZ control, which is of primary concern to the aviation unit, is actually established by the supported unit, with or without pathfinder support.

7.17 LZ PREPARATION.

a. The LZ may be prepared by artillery, TAC air, armed helicopters, or any combination of available fire support. Experience indicates that a preparation should normally be planned on LZs prior to initial landing. Determination to fire the preparation rests with the AMF commander and can be a last minute decision.

b. Napalm and other incendiary ordnance are not normally used in the immediate vicinity of the LZ just prior to landing. They may be used when required against appropriate targets provided the AMF commander has considered the possibility of undesirable fires and reduced visibility from smoke.

c. Armed helicopters will normally reconnoiter the LZ prior to arrival of the airmobile column. They suppress as required, reconnoiter by fire around the LZ, and provide final landing instructions to the lift force.

d. To provide aerial fire support, armed helicopters may fly abreast or slightly ahead of the AMF to deliver fires to the front and flanks; follow the formation to protect the rear; or enter a continuous firing pattern upon reaching the LZ to cover around LZ.

e. Fire support preparations and tactics should be varied frequently. To be most effective, preparations should be short and intensive.

f. Preparations may be shifted rather than lifted as the assault formation approaches. An effective method of continuing the fire support during the assault is to shift artillery to one flank, conduct a simultaneous air strike on the opposite flank and use armed helicopters on approach and departure lanes. When using such a plan navigation for the airmobile column must be precise and tightly controlled in order to avoid AF flight paths and artillery gun target lines. Rigid fire control is necessary and can be accomplished if the ALO or FAC and the artillery LNO or FO are in the C&C helicopter with the AMF commander and the mission commander. Each commander and fire support controller will require positive communication with his own elements.

SECTION IV

AIR MOVEMENT PLAN

7.18 PREPARATION. The air movement plan is included as part of the operations order and operations overlay. The plan is prepared only after completion of the landing plan and the ground tactical plan and must support both plans. The AMF commander is responsible for preparation of the air movement plan. Technical assistance is provided by the supporting aviation commander and the pathfinder commander (when pathfinders are available). The air movement plan consists of the flight route diagram, air movement table, flight formation, flight altitude, flight speed, air traffic control procedures and the air loading table. When this information is not published in written orders it is covered by verbal orders. (See TM 57-210 for a detailed discussion of worksheets and forms used in air movement planning).

a. Flight Route Diagram. The flight route diagram includes the flight corridors, flight routes, and air control points used to prescribe control of the airmobile column over the terrain. This information can be placed on the operations overlay or a strip map technique may be used. Normally, the reaction time required for airmobile operations is so immediate that the flight route diagram exists only on the maps of the AMF and aviation commander, and selected key individuals that need this information such as the FSCOORD, and ALO.

(1) The flight corridor. Supporting fires must be controlled in order to insure maximum support without endangering the airborne airmobile force. The flight corridor includes all flight routes and is designated by higher headquarters and coordinated with appropriate air defense artillery agencies. All fires within these corridors are coordinated or restricted. Ideally, the least possible restrictions are imposed. The width of the corridor will vary with each operation and will be determined by:

(a) Number of flight routes; out, return, crossover, and alternate.

(b) Aircraft formation.

(c) Type of aircraft.

(d) Terrain.

(e) Weather and visibility.

(f) Navigational aids.

(2) The flight route. The flight routes to and from the LZ are selected to avoid known or suspected enemy positions. It is desirable that flight routes follow terrain which facilitates navigation to and from the LZ's. Alternate routes are planned with crossover routes and with the same degree of detail. Each lift on a multiple lift assault should use a different flight route. The return flight routes should also be planned with variation. Specific considerations in the selection of flight routes are:

(a) Terrain.

(b) Weather.

(c) Time of movement.

(d) Enemy capabilities, with emphasis on air defense weapons.

(e) Friendly supporting weapons with emphasis on areas to avoid, and planned artillery fires and air strikes.

(f) Distance to the objective area.

(g) Escort forces; US Air Force and armed helicopter.

(h) Communications.

(3) Flight Route Controlpoints.

(a) Flight route controlpoints are control measures that permit more precise timing, and insures that the airmobile column does not overfly undesirable areas. Air controlpoints are easily recognizable terrain features or established electronic navigational facilities.

(b) Commonly used controlpoints:

1. SP - The start point is a geographical location over which airmobile column flies to initiate timing. The column should be in the desired formation, and at the established speed flight route heading and altitude when passing the SP. The SP is used for control from the loading zone to LZ and from the LZ returning to the loading zone when required.

2. ACP - Air controlpoints are geographical locations easily identified from the air, used to define the flight route and as reporting points to monitor the progress of the airmobile column.

3. CCP - The communications controlpoint is a predesignated ACP on the flight route, over which the serial command for each LZ initiates communications with the appropriate LZ control station for landing instructions.

4. RP - The release point is a readily identifiable geographical location over which the serials are released to proceed to their respective LZ. The time from the RP to touchdown in the LZ is known as the terminal guidance phase. The distance from the RP to the LZ must be sufficient to allow the airmobile column to divide into serials and flights to land in the prescribed formation size in the respective LZ. Normally 5 to 7 kilometers is sufficient distance to accomplish this. This distance is also required to allow the formation time to descend and slow down for landing. The heading from the RP to LZ desirably should be the same as the direction of landing. The RP is normally the final control point used to lift or shift artillery fires, and commit the armed reconnaissance flight.

5. All control points may be assigned code names or numbers.

b. The Air Movement Table.

(1) Purpose. The air movement table (Tables 7.1 and 7.2) is prepared jointly by the supported and the supporting unit commanders. When included as part of the operation order, it is the most complete time table published concerning the overall airmobile operation. The table is a very exacting time schedule, prepared to assure that the linkup of aviation and ground units is accomplished efficiently with subsequent arrival of each flight at the desired LZ at the desired time. Even in small operations (company-size) the air movement table requires maximum coordination between the supported and supporting units.

(2) Explanation of Air Movement Table.

(a) Regardless of how small the airmobile operation may be, the air movement table will minimize confusion. In its smallest form it may be covered informally by verbal instructions to both the supported and supporting units. When written as part of paragraph 3 of the operations order an abbreviated air movement table is normally used. Table 8.1 is a method of providing this information in writing.

(b) For battalion or larger size airmobile operations a detailed air movement table may be required to insure the degree of control necessary. Table 7.2 is a type air movement table that will provide all the details required for the most complex of airmobile operations. If the air movement table is inadequate or inaccurate, the success of the operation may be jeopardized. Therefore, time permitting, the more detailed (in writing) the air movement table - regardless of the complexity of the operation - the greater the assurance of a smooth operation.

* * * * *

OPORD_____

Reference: Map_____

3. EXECUTION

* * * * *

h. Coordinating Instructions:

* * * * *

(12) Aircraft Allocation and Movement Data:
(a) Route LEMON is primary route for approach, alternate for return; Route GRAPE is alternate route for approach, primary for return.
(b) Formation: Heavy left.
(c) Actual altitude: Nap-of-the-earth.
(d) Speed: 80 knots.
(e) Type Loads: 6 spaces/UH-1D
(f) Air Load Table: Annex C.
(g) Air Movement Table:

Trans Unit	Trans-ported Unit	Serial	Chalk No.	Loading Zone	Loading Time	Takeoff Time	Landing Zone	Landing Time
21st AvnBn	Co B	1	1-24	PEAR	0702	0704	BRAVO	0725
21st AvnBn	Co A	2	25-48	PEACH	0700	0702	ALPHA	0725

Table 7.1 Abbreviated Air Movement Table.

LINE	MISSION NUMBER	TRANS UNIT	TRANSED UNIT	SERIAL	TYPE ACFT	NO ACFT	CHALK NO	WX DEC	WX DELAY	LOADING ZONE	ACFT ARR	LOADING TIME	STA TIME	ENG TIME	TAKE OFF	SP TIME	RP TIME	ROUTE	LZ	LANDING TIME **
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t
	A-102	21st Avn Bn	Co B 1-66	1	UH-1D	24	1-24	0645	30min Increments	PEAR	0700	0702	0703	Running	0704	0707	0721	BLUE	BRAVO	0725

**

NEXT SER	REMARKS
u	v
2	None

Table 7.2. Air movement table.

c. Flight Formation. (See Figure 6.2.) The flight formation for any given mission is influenced by technical as well as tactical considerations. The flights are organized and arranged within the column by the aviation commander to support the landing and ground tactical plans. Armed helicopters will escort the transport helicopters to provide fire support en route and during the landing phase. Transport formations may be staggered to allow the door gunners to fire during approach or takeoff from a LZ when required.

d. Flight Altitude. Low altitude flights reduce the enemy's capability to detect the airmobile column or to effectively utilize long-range, large-caliber weapons fire except over open terrain. Contour flying enables aircraft to take maximum advantage of terrain irregularities, thus gaining some protection from small arms fire, enemy acquisition radar, and ground-to-air missiles. However, the primary consideration may be to avoid enemy small arms fire by flying at a higher altitude, generally 1500 to 2000 feet above the ground.

e. Flight Speed. The prescribed speed to be flown depends on the type of aircraft, the formation, and the use of external sling loads. The aircraft normally fly at the rated cruising speed. When two or more different types of aircraft fly in a single serial, the aircraft fly at the cruising speed of the slowest type.

f. Air Traffic Control. An air traffic control unit is (when available) used in staging areas and, on occasion, in LZ's whenever high-density traffic or instrument weather is anticipated. The airborne command post will be used to control the airmobile column en route to the LZ.

g. Air Loading Table.

(1) The air loading table is closely allied to the loading plan, but it is part of the air movement plan. Before the air loading table can be prepared a determination must be made as to the number of aircraft available for the operation. Actually, the number of aircraft available must be determined early in the planning to allow for completion of the air movement table and other planning. This decision is just one of many interrelated facets of airmobile planning.

(2) When planning an operation, the AMF commander should request spare aircraft over his minimum requirements. Frequently the total number of aircraft available will be given in the warning order. The AMF commander should allocate his support early in the planning to allow subordinates time to prepare their air loading tables.

(3) Aircraft requirements can be accomplished by one of three methods - weight, type load, and space methods. TM 57-210 and FM 57-35 cover in detail the use of each method.

(4) The allowable cargo load is determined in the customary method, using density altitude, fuel required, etc.

(5) Once the aircraft have been allocated and the ACL determined, the air loading table can be prepared. The air loading table is prepared to account for and assign every individual and piece of equipment to be moved into the objective, to a special chalk number. Table 7.2 is a type air loading table that can be used to accomplish this phase of planning. is completed it may be included as an appendix to the air movement plan annex, but more often it is not published. The completed tables are turned over to the unit representative of the LCG or the LCGO. Verbal orders are issued to each member of the command assigning him to an aircraft.

(6) Factors to consider in preparing the air loading table include:

(a) Primary consideration is given the mission. Cross loading is accomplished throughout the loads to insure loads are consistent with the ground tactical plan.

(b) Troops are briefed in detail on the air loading table using all available briefing aids. Emphasis is placed on location of internal and external loads upon arriving in the loading area.

(c) Insure that loads are within the announced ACL.

(d) Sling loads: The unit to be lifted provides all essential equipment and personnel for sling loading. Sling loaded helicopters should be located at the rear of formations unless simultaneous arrival is desired. In this case the sling loaded helicopters hook up and depart prior to the remainder of the information. Sling loads are located in the loading zone to facilitate hookup based upon the sequence of takeoff.

(e) It must be recognized that loading is not always accomplished under ideal pre-planned conditions. Many situations will require loading without preconceived plans and necessitate that loads be made up on site.

1. Individuals carry only essential combat equipment. Ammunition accompanies each weapon in amounts necessary for mission accomplishment.

2. Cross loading is accomplished in as far as possible.

3. Items of equipment, with all parts and accessories needed to make them operational, are loaded in the same aircraft.

4. Crews accompany crew-served weapons.

7.19 CONDUCT FROM LOADING ZONE TO LZ.

a. Take off may be by individual aircraft, by flight, or by the entire serial simultaneously. Under some conditions - such as an extremely dusty loading zone, a restricted LZ, or high density altitude - it is advisable to break the serial into flight increments for takeoff. Simultaneous liftoff from the loading zone is desirable, for the following reasons:

(1) Escort and fire support can provide more effective cover.

(2) Airmobile force control is more positive.

(3) The airmobile force presents itself as a target to ground fire for a shorter period of time.

(4) A prolonged takeoff from the loading zone may permit repositioning of weapons to take the remaining aircraft under fire as they depart.

b. Join-up Techniques.

(1) The flight leader adjusts the speed and rate of climb of his flight to insure that the flight closes in the prescribed formation at the required altitude.

(2) When a takeoff is made in increments less than the total airmobile serial, a forming turn can be made to allow all elements of the flight to assemble in formation. The forming turn is not required during a simultaneous takeoff.

(3) The flight is closely regulated by varying air speed and making minor deviations so that the airmobile formation passes over the SP at the precise time scheduled.

AIRLOADING TABLE (TM 57-210)		HEADQUARTERS		DEPARTURE AIRFIELD	DATE
ANNEX TO		PLACE		LOADING BEGINS	STATION TIME
SERIAL NUMBER	AIRLIFT UNIT	ACFT CHALK NO.	GROUND UNIT	AIRCRAFT LOADED WITH	REMARKS (Including special equipment for loading)

Table 7.3. Airloading table.

c. En route Control.

(1) The lead flight leader reports passing each ACP to the AMF commander unless otherwise instructed.

(2) The aviation commander (or serial commander) insures that the FSCOORD and the ALO are always aware of the airmobile column location.

(3) The aviation commander changes en route formations as required and implements emergency and crash procedures when necessary.

(4) When a significant threat arises along the flight route - such as a heavy concentration of enemy fire - the aviation commander will give the order to switch to previously designated alternate flight routes. If the LZ is to be changed, the AMF commander will make this decision and inform the entire AMF of his decision.

d. Fire Support En route.

(1) Armed helicopters provide security for the airmobile column, security for downed aircraft, aerial reconnaissance, and other assistance en route as directed.

(2) Air Force aircraft may provide security to the airmobile column, in an air alert status rather than overhead the column.

e. Recovery of downed crews and aircraft.

(1) In the event an aircraft is forced down, the senior individual assumes command.

(2) Personnel recovery is made as the mission permits. Mission requirements normally have priority over aircraft or personnel recovery.

(3) A recovery aircraft should be designated for each airmobile operation. Normally, it will be crewed by an aircraft maintenance officer, aircraft mechanic, and a medic. Tools and parts for minor repairs, and necessary rigging to prepare the aircraft for sling loading should be on board the recovery aircraft. This is an aviation responsibility. Rigging of an upright, relatively intact utility helicopter for sling evacuation takes two trained men four minutes.

(4) If aircraft recovery is not possible, personnel, SOI's weapons, ordnance, and radios should be removed and recovered.

(5) Armed helicopters will normally accompany the recovery helicopter to protect it and the downed aircraft.

(6) Downed aircraft should be destroyed only as a last resort and then only on order of the AMF commander or his superior.

(7) See Appendix V, Unit SOP, for duties of Infantry personnel.

SECTION V

LOADING PLAN

7.20 COMPOSITION OF THE LOADING PLAN.

a. The loading plan is prepared to select, establish and control the loading zone; plan for movement of troops and equipment to the loading zone; establish the commander's priority of loading for each unit, to include manifesting and briefing of the troops. The loading plan does not include loading tables which are a part of the air movement plan. Except for the most complex airmobile operations, the loading plan is included in paragraph 3 - coordinating instructions. Whenever possible loading instructions will be issued verbally.

b. The "simple" loading plan for small-scale operations (company-size or smaller) is normally a matter of announcing where and at what time the troops are to load.

c. For larger operations (battalion-size or larger) a written plan may be required to control movement of troops and equipment to the loading zone, designation of unit loading sites, and the timing and priority of loading.

d. The requirement for written loading instructions can be minimized by advance planning, and by detailed unit SOP's for the organization and operation of the loading zone.

e. The loading plan, regardless of the simplicity desired, must receive equal command attention in preparation. The ultimate success of the operation hinges upon a properly developed loading plan and the subsequent control of unit loading.

7.21 SELECTION OF LOADING ZONES.

a. The selection of loading zones is the first major step in the loading plan. Like the rest of the airmobile operation, the loading plan and selection, organization and control of the loading zone is the responsibility of the supported commander. The aviation commander should be consulted for recommendations on the selection of all loading zones before a decision is made to use any area for this purpose.

b. When selecting loading zones there are several tactical factors and aviation criteria which must be considered jointly by the supporting and supported commanders.

(1) The location of the troops is perhaps the most important tactical consideration. When there are several acceptable areas, the one in closest proximity to the troops should be used.

(2) At the loading zone the supported and supporting forces are integrated into the tactical airmobile force. Final coordination should take place here - prior to departure for the LZ. To facilitate this, a coordination point on the loading zone should be designated to facilitate the linkup of the aviation commander with the unit commander.

(3) Sufficient cover and concealment should be available to conceal assembled troops and equipment.

(4) The selected area should be clear of obstacles and as large as possible. These aviation criteria are particularly important in the loading zone. It is here that helicopters arrive with a maximum planned fuel load which requires the helicopter to labor under the most adverse conditions of the operation. The ultimate success, with minimum of confusion, and limited use of multiple sorties, rests upon a properly selected loading zone.

(5) Ideally the loading zone should be large enough to accommodate simultaneously all helicopters required to lift a serial. When this is not possible the flights join-up in the air prior to reaching the SP.

(6) See Chapter 6 for a discussion on criteria for selection and marking of LZ's as this information is equally applicable to selection and marking of loading zones.

7.22 LOADING ZONE CONTROL.

a. For lifts of company size or larger the aviation LNO should be present in the loading zone to assist the supported unit and to direct aircraft actions to support any changes in the operation.

b. Pathfinder control is provided in the loading zone whenever available. (See Chapter 6.)

c. As stated previously, it is the responsibility of the supported commander to select, organize and control the loading zone. The aviation LNO and pathfinders may be present to control the helicopters and assist the supported unit in any way possible. Therefore, the control of the supported unit personnel and equipment rests solely with the AMF commander. In all air-mobile operations the AMF commander should invest this authority in one individual for efficiency of control. The individual ideally should be someone from the rear echelon.

(1) At the company level the executive officer is frequently assigned the mission of planning, organizing and supervising the loading zone. He is assisted by enlisted personnel, who are trained in loading and ground control of helicopters. These personnel should also be part of the rear echelon.

(2) Nothing should be left to chance in the loading zone. At battalion level a loading control group (LCG) is organized under the control of the loading control group officer (LCGO). The officer is frequently the unit S4 and his enlisted assistants are trained personnel from headquarters and headquarters company. Again, these personnel should be part of the rear echelon.

(a) It is the function of the LCG to assure that personnel and equipment are ready for loading and loaded on time.

(b) The organization and marking of the loading zone must be within the capabilities of the LCG, with or without pathfinder assistance - for both day and night operations.

(c) The physical loading of all cargo is accomplished by the LCG.

(d) The LCGO controls the movement of units to the loading area to prevent congestion and confusion. The ideal situation is the simultaneous arrival of the troops, by aircraft loads, and the aircraft in the loading zone at the same time. This insures maximum security, rapid loading, and subsequent immediate take-off of the aircraft.

(e) The LCGO should use a designated FM frequency to talk to the aviation units and a different frequency to control the supported units for call-up and loading.

(f) The LCGO may also establish the loading zone straggler control point and is charged with outloading all personnel "bumped" from planned loads.

7.23 MANIFESTS. A loading manifest of each aircraft should be kept at the loading zone. This record should be simple and capable of quick preparation in order to avoid a large administrative requirement. For example, it could be a sheet from a squad leader's notebook listing the men and equipment loaded into his aircraft and containing tail number or chalk number. All such lists are left with a unit representative in the rear echelon. Manifesting is not always possible when units are extracted under fire or when emergency loading is required. Under such conditions personnel are manifested by squads, and the platoon leader sergeant retains the platoon manifests.

APPENDIX I

GLOSSARY OF AIRMOBILE TERMS AND ABBREVIATIONS

I. 1 GENERAL. The following terms will be encountered when committed in the Army airmobility environment. When one term is known by other synonyms the term that is given primary usage in this Handbook will be defined with the synonyms listed in parenthesis.

I. 2 REFERENCES.

a. AR 320-5 Dictionary of United States Army Terms (AD).

b. JCS Pub. 1. Dictionary of United States Military Terms for Joint Usage (JD).

c. Common Usage. Many terms herein are adapted from "common usage", particularly in Vietnam.

-A-

administrative flight - A flight that is not related to a tactical situation.

administrative loading - The loading of personnel and equipment and supplies for maximum use of space.

accompanying supplies - See assault supplies.

aerial command reconnaissance - The utilization of an aerial vehicle by a commander to obtain or verify specific information of military value to the current or future tactical operations.

aerial fire support - A capability of Army aviation to provide the ground force commander with offensive and defensive fires for the destruction or neutralization of enemy targets.

aerial observation - Visual scanning of the area of interest from an aerial vehicle unassisted by an electronic means. Differs from aerial reconnaissance and surveillance in that aerial observation is accomplished on every flight and is not a planned mission unless a trained aerial observer is airborne for specific intelligence collection efforts.

aerial reconnaissance - A technique of reconnaissance employing air vehicles and visual observation or the use of sensory devices.

aerial rocket artillery - Army helicopters configured with an air-to-ground rocket delivery system, used for area fire, and organic to an artillery battalion.

aerial surveillance - The systematic observation of specific air or surface areas by visual, electronic, photographic, and other means employing an aerial platform to provide timely intelligence information for supported tactical ground commanders.

aerial security - Measures taken by a command through utilization of aerial vehicles to protect itself from observation, annoyance, or surprise attack. Can be applied in an offensive and defensive posture.

aerial target acquisition - The detection, identification, and location of a target by Army aviation means, in sufficient detail to permit effective employment of a weapons system to neutralize or destroy the target.

aeromedical evacuation - (See medical evacuation.) The movement of patients to and between medical treatment facilities by Army aviation, with a capability to administer medical aid.

air alert - (airborne alert) The operational status of aircraft in the air that are ready for the immediate accomplishment of a mission.

airborne operation - An operation involving the movement and delivery by air, into an objective area, of combat forces and their logistic support for execution of a tactical or a strategic mission. The means employed may be any combination of airborne units, air transportable units and types of transport aircraft, depending on the mission and the overall situation.

air control point (ACP) - An easily identifiable point on the terrain or marked with an electronic navigational aid to provide necessary control during air movement.

air control team - See tactical air control party.

aircraft commander (AC) - a qualified aviator designated as the commander of a specific aircraft and appointed on competent orders.

airhead - 1. A designated area in a hostile or threatened territory which, when seized and held, insures the continuous air landing of troops and materiel and provides maneuver space necessary for projected operations. Normally, it is the area seized in the assault phase of an airborne operation. 2 A designated location in an area of operations used as a base for supply and evacuation by air. Synonymous with objective area.

airhead line - A line described or portrayed in an operation order which marks the outside limit of that part of the airhead to be denied to the enemy.

air landed - Moved by air and disembarked, or unloaded, after the aircraft has landed.

airlanded operation - An operation involving air movement in which personnel and supplies are air landed at a designated destination for further deployment of units and personnel and further distribution of supplies.

airlanded supply - The supply or resupply by air to ground units in which aircraft are landed and unloaded on the ground.

airlanded units - Units, other than airborne, transported and landed by aircraft in an airborne operation.

airlanding facility - Those minimum essential facilities which can reasonably be constructed in an airhead to permit the continuous air landing of aircraft. The term denotes facilities less elaborate than an airfield.

airlift - (noun) The total weight of personnel and/or cargo that is, or can be, carried by air or that is offered for carriage by air. (verb) To transport passengers and cargo by use of aircraft.

airmobile combat assault (CA) - (Combat assault helicopter assault force) Tactical organization, combining helicopters and supported ground units, to conduct combat operations into an unsecure LZ.

airmobile column - The composite AMF proceeding over the same flight path at the same altitude.

airmobile extraction (AME) - See extraction.

airmobile force (AMF) (airmobile units) - The aviation and ground combat elements combined to conduct airmobile operations.

airmobile force commander - (ground commander) The ground commander who exercises control of all elements of an airmobile force.

airmobile operations - Operations in which combat forces and their equipment move about the battlefield in air vehicles, under the control of a ground force commander, to engage in ground combat.

airmobile raid - A combat assault for the purpose of quickly seizing and/or destroying limited objectives and killing or capturing the enemy, followed by an extraction. A short duration airmobile operation.

airmobile resources - The total aviation assets available to the supported commander. These resources may be any combination of organic or nonorganic aviation units.

airmobility - Tactical mobility afforded a ground maneuver force by Army aircraft; the capability of a ground force to tactically deploy through the air; implies tactical integrity and cross loading.

air movement - (administrative movement) Air transport of units, personnel, supplies and equipment, including air drops and air landings.

air movement plan - Used in detailed planning for an airlift when the airlift of troops is involved. It is prepared jointly by the respective ground force and aviation unit commanders.

air movement table - A table prepared by a ground force commander in coordination with an air lift commander. This form, issued as an annex to the operation order: (a) indicates the allocation of aircraft space to elements of the ground units to be airlifted; (b) designates the number and type of aircraft in each serial and (c) specifies the departure area, time of loading and takeoff.

air transportable units - Units, other than airborne, which are trained and whose equipment is adapted for movement and delivery by transport aircraft.

allowable cargo load (ACL) - The number of troops, or amount of cargo, or combination, determined by weight, cubic displacement and distance to be flown, which may be transported by one aircraft in one sortie.

armed helicopter (gunship) - A helicopter equipped with an attached weapons system fired by the AC or CP. Special armed helicopter weapons systems are: gunship - UH-1B helicopter armed with four 7.62 machineguns, with six thousand rounds of ammunition and fourteen 2.75 HE rockets; MAD system - Mortar Aerial Delivery System employed on a UH-1 helicopter; frog - UH-1B helicopter armed with M-5 armament System (40mm grenade launcher) one hundred and fifty rounds of 40mm ammunition and twenty-four 2.75 HE rockets; hog - (ARA) UH-1B helicopter armed with fourty-eight 2.75 HE rockets.

armed reconnaissance - An offensive mission conducted to search for and attack targets of opportunity in a designated area or along designated routes.

army aviation element - (AAE) A liaison element from the support Army aviation element to the supported unit for coordination and planning of aviation operations. This element is normally found at division and higher levels.

assault aircraft - Powered aircraft, including helicopters, which move assault troops and cargo into an objective area and provide for their resupply.

assault echelon - The lead elements of an AMF scheduled for initial assault on the objective area.

assault force - In an amphibious or airborne operation, those units charged with the seizure of the lodgment area.

assault supplies - (accompanying supplies) Those supplies of all classes which accompany the assault elements of any unit into the objective area.

attach (attachment) - The placement of units or personnel in an organization where such placement is relatively temporary. Subject to limitations imposed by the attachment order, the commander of the formation, unit, or organization receiving the attachment will exercise the same degree of command and control thereover as he does over units and persons organic to his command. However, the responsibility for transfer and promotion of personnel will normally be retained by the parent formation, unit, or organization.

-B-

back haul - The pickup of troops, cargo, or equipment to include expended ammo containers, from the operational area on return flights to the stage field to prevent aircraft from returning empty.

base camp - A division or brigade camp established to support sustained combat operations and provide continuous control of the TAOR. An active defense must be provided for the base camp.

basic planning guide - Report prepared by a ground force showing the exact status of personnel and equipment of the unit to determine the aircraft needs for an airborne operation.

-C-

center of gravity (CG) - The point about which an object would balance if supported at that point; or the point at which the weight of an object or group of objects may be considered concentrated.

chalk number - A single aircraft or aircraft load within a flight element.

column - A tactical grouping of one or more serials on a common mission, at the same altitude, traveling in the same direction, under a single mission commander. All aircraft may or may not land at the same time but will land at the same LZ.

combat assault - See airmobile combat assault.

combat loading - The arrangement of personnel and the stowage of equipment and supplies in a manner designed to conform to the anticipated tactical operation of the organization embarked. Each individual item of cargo is stowed so that it can be unloaded at the required time.

contour flying - Flying at low altitude in which the flight pattern conforms generally to the contours of the area. It is used to avoid observation or detection of an aircraft and/or the points to and from which it is flying.

controlled airspace - An airspace of defined dimensions within which air traffic control service is provided.

control point - 1. A position marked by a buoy, boat, aircraft, electronic device, conspicuous terrain feature, or other identifiable object which is given a name or number and used as an aid to navigation or control of aircraft. 2. A conspicuous terrain point which is given a name or number as a means of control of traffic movement.

cross loading - See combat loading.

-D-

departure airfield - See loading area.

drop altitude - Actual altitude of an aircraft above the ground at the time of a parachute drop or the initiation of an airdrop.

drop point - A designated point within a landing zone where helicopters are unable to land because of the terrain, but in which they can discharge cargo or troops while hovering.

drop zone (DZ) - A specified area upon which airborne troops, equipment, and supplies are dropped by parachute, or on which supplies and equipment may be delivered by free fall.

-E-

eagle flight - An airmobile force either on ground or air alert to perform rapid reaction missions.

echelonment - Arrangement of personnel and equipment into assault or combat, followup, and rear components for groupings (echelons).

element - 1. Subdivision of a command or any organization. 2. A portion of an airborne or airmobile unit described by its method of entry into the combat area, such as parachute element, aircraft element, or land element. 3. A single Army aircraft.

escort aircraft - An aircraft which accompanies another for the purpose of providing aerial fire support or pickup of crew and passengers in the event the escorted aircraft is forced down.

extraction - (airmobile extraction) Voluntary or involuntary withdrawal by air of troops from a PZ. Resistance can be expected to increase as each lift is made and the friendly force's perimeter becomes smaller.

-F-

flight - Two or more Army aircraft, with a common mission, under the control of a single flight leader.

flight leader - An Army aviator who commands a designated flight of Army aircraft on a common mission supporting one unit.

flight rendezvous - An air control point in the vicinity of a helicopter transport or base where helicopters are assembled into flights prior to proceeding to the wave rendezvous. It is designated by code name.

flying speed - Any airspeed above stalling speed and within the normal speed range for any specific conventional aircraft.

followup echelon - Elements moved into the objective area after the assault echelon.

followup supply - That initial resupply which is delivered directly to forces in the airhead by air. It is prepackaged on a unit basis for automatic or on call delivery.

forming turn - A turn executed on take-off to permit aircraft to join a formation.

fuel endurance - The total time an aircraft will fly before its fuel is exhausted.

-G-

ground control - A control element located in a PZ to transmit changes in the tactical plan or mission and to coordinate the orderly flow of air traffic in and about the PZ.

-H-

heavy drop - System of delivery of heavy supplies and equipment by parachute. Either a conveyor system alone, or a combination of an extraction parachute and conveyor system, can be used to discharge the load from an aircraft in flight.

heavy fire team - (heavy gun team) Three armed helicopters operating as a flight under the control of a single mission commander.

helicopter assault force - See airmobile combat assault.

heliport - An area prepared for the accommodation, landing, takeoff of helicopters only.

H-hour - The time of touchdown of the lead helicopter of the assault echelon in the landing zone.

-I-

imagery - Collectively the representation of objects reproduced electronically or by optical means on film, scope, screen, or other media.

infrared (IR) - Those invisible rays just beyond the red of the visible spectrum.

intrusion detection devices - Ground or air electronic equipment used to maintain surveillance over areas inaccessible for visual observation.

-J-

joint - Between two or more services of the same nation. When all services are not involved, the participating services shall be identified e.g., Joint Army Navy. 1. Connotes activities, operations, organizations, etc., in which elements of more than one service of the same nation participate. 2. When prefixed to any of the materiel terms applicable to joint usage, connotes that the definition of the designated term is enlarged to embrace the sum of the Army, Navy, Air Force and Marine Corps quantities.

-K-

knot - A unit of speed equivalent to 1 nautical mile or 6,076.1 feet per hour. Sixty nautical miles equal 1^{c} of a terrestrial great circle.

-L-

laager - The positioning of helicopters in a secure forward area to accomplish a mission more effectively. Armed aircraft are positioned so that weapons systems may be used in the defense.

land tail - That part of an airborne or air transported unit which is not committed to combat by air and will join the organization by land movement.

landing aids - Any illuminating light, radio beacon, radar device, communicating device, or any system of such devices for aiding aircraft in an approach and landing.

landing area - A general area that encompasses one or more landing zones for landing troops and material either by air delivery or air landing. In a restrictive terrain situation the landing area, zone, site, and point may be one and the same locations; i.e., a single helicopter landing area on a mountain top.

landing mat - A prefabricated portable steel mat so designed that any number of planks (sections) may be rapidly fastened together to form surfacing for emergency runways, landing beaches, etc.

landing point - A designated or selected touchdown point where a single helicopter lands and comes to rest to disembark troops or cargo.

landing site - A subdivision of a landing zone that contains one or more landing points.

landing zone (LZ) - A subdivision of a landing area that encompasses one or more landing sites, normally has the required control facilities.

landing (loading or drop) zone control center (pathfinder control center) - A special trained and equipped team to control air traffic in and around the established area, to promote safe, orderly, and expeditious air traffic. The team is normally pathfinders but may be organized from the supported unit. This team is not the same as the LCG.

lead aircraft - The first aircraft in each flight.

lift helicopter (slick) - A helicopter used for the purpose of lifting troops and/or cargo, that has only protective armament systems.

light fire team - (light gun team) Two armed helicopters operating as a flight under the control of a single mission commander.

lightning bug ship - A helicopter equipped with search lights to illuminate targets.

lift - A single trip loaded from a loading area to a landing area or drop zone. A lift may consist of one or more aircraft and one or more ground and/or aviation units.

lift frequency - A frequency designated in the supporting unit's SOI, or a common frequency designated by the AMF commander, to be used during airmobile operations by both supported and supporting units.

loading area (departure airfield) - A general geographical area that encompasses one or more loading zones where supporting aviation is linked up with the supported unit for the purpose of initiating an airmobile operation. The security of the loading area is not normally established by the participating force.

loads control group (LCG) - A team organized and trained by the supported unit to prepare cargo and supplies to be airlifted; establish the loading zone; and control the movement of troops and cargo/supplies to be loaded. The loads control group officer (LCGO) will be co-located with the pathfinders and aviation LNO when present in the loading zone.

loading point - A touchdown point designated by the LCG, where a single helicopter lands and comes to rest to embark troops or cargo.

loading site - A subdivision of a loading zone that contains one or more loading points.

loading zone - A subdivision of a loading area that encompasses one or more loading sites; normally where the LCG is located with the required control facilities.

low-level flight - Flight conducted at an altitude to avoid or minimize detection or observation of an aircraft or the points from and to which it is flying. The route is preselected and conforms generally to a straight line and a constant altitude above the terrain. This method is best adapted to flights conducted over extended distances or periods of time.

-M-

manifest - A document specifying in detail the passengers and/or other items carried for a specific destination.

marking panel (panel) - A sheet of material displayed by ground troops for visual signaling to friendly aircraft. See panel code.

medical evacuation - A secondary mission of all Army aircraft. Implies that a medical attendant is not available for enroute treatment.

minimum safety altitude - The altitude below which it is hazardous to fly owing to presence of high ground or other obstacles and enemy small arms fire.

mission ready - A term used to describe an aircraft which is completely capable of performing its combat mission. Requirements are: flyable condition, operational radios, functional weapons systems, required fuel and ammunition, and a complete, trained crew.

-N-

nap-of-the-earth-flight - Flight as close to the earth's surface as vegetation and obstacles will permit and following the contours of the earth. The pilot preplans a broad corridor of operation based on known terrain features which has a longitudinal axis pointing toward his objective. In flight, the pilot uses a weaving and devious route within his preplanned corridor while remaining oriented along his general axis of movement in order to take maximum advantage of the cover and concealment afforded by terrain, vegetation, and manmade features. By gaining maximum cover and concealment from enemy detection, observation, and firepower, nap-of-the-earth flight exploits surprise and allows for evasive actions.

nautical mile - A measure of distance equal to one minute of arc on the earth's surface. The United States has adopted the International Nautical Mile equal to 1,852 meters or 6,076.1 feet.

normal cruising speed - The true airspeed which an aircraft can normally be expected to maintain at some standard power setting below rated military power. This speed will vary with altitude.

-O-

objective area - A defined geographical area within which is located the objective to be captured or reached by the military forces. In airmobile operations synonymous with airhead.

on station - When an armed helicopter flight is over its designated orbit point or is in a position whereby it can support the ground commander it is said to be on station. Calls for fire could then be relayed to this armed flight.

overhead cover - A tactical mission assigned to armed helicopters in support of a ground operation which, unless directed otherwise, involve providing aerial fire support, maintaining contact with the supported unit and providing a screen to the supported unit as directed.

-P-

palletized unit load - Quantity of any item, packaged or unpackaged, which is arranged on a pallet in a specified manner and securely strapped or fastened thereto so that the whole is handled as a unit.

panel code - A prearranged code designed for visual communications between ground units and friendly aircraft.

pathfinder guidance - Aircraft guidance provided by pathfinders.

pathfinders - Teams to establish and operate navigational aids for the purpose of guiding aircraft to drop and landing zones.

payload - The sum of the weight of passengers and cargo that an aircraft can carry.

pickup zone (PZ) - (See extraction) The designation of a tactical extraction area, secured by the extracted force, with diminishing security after each lift.

platoon of aircraft (plat) - The TOE organization of aircraft under command of a platoon commander, further organized into TOE sections.

point target - A target presenting a comparatively small area and/or which must receive a direct hit to be affected.

pre-strike - Air Force, artillery, or armed helicopter fire placed on an LZ and/or objective area prior to the arrival of the airmobile task force.

protective fire - Aerial fire power available to Army aircraft lightly armed with machineguns, not designed to lay down a large volume of suppressive fire. These aircraft do not possess a fighting capability and have a primary mission that prohibits employment in a fire support role.

-R-

radius of action - The maximum distance that an aircraft can travel from its base along a given course with a prescribed load and return without refueling. Radius-of-action computation figures include fuel reserves and other operational safety factors.

ramp alert - Aircraft on the ground at a base or forward strip for take-off within a specified time frame, usually 15 minutes. Usually denotes aircraft linkup with combat troops/loads. In the case of armed helicopters, fully armed.

range (aircraft) - The maximum distance that an aircraft can safely travel without refueling.

rapid reaction - An emergency commitment of standby armed fire teams and loaded troop carriers. These standby aircraft are to be off the ground within five minutes, en route to the assigned area.

reaction force - Airmobile reserve.

rear echelon - Elements of a force which are not required in the objective area.

release point (RP) - A clearly defined point on a route at which specified elements of a flight of aircraft revert to the control of their respective commanders.

required fuel reserve - The usable fuel available and required to be aboard an aircraft after it arrives at its destination.

-S-

section - As applied to Army aircraft, the lowest tactical subdivision of a platoon, commanded by a section commander.

serial - A tactical grouping of 2 or more flights, under control of a single mission commander, separated from other tactical grouping of flights by time and space. All aircraft will land in the same LZ without a planned time and space separation.

side-looking airborne radar (SLAR) - Airborne radar equipment that is employed for the surveillance of the terrain. This equipment scans laterally at right angles to the flight path. Antenna tilt permits the extension of terrain coverage to a depth of many miles. A moving target indicator is synchronized with the radar picture of the area under surveillance. Photographic records of SLAR surveillance flights are not as detailed as those obtained from high resolution radar. Due to the material scan features of this equipment, surveillance flights can be flown within friendly areas while obtaining extensive coverage of enemy terrain.

sortie - A sortie is one aircraft making one take-off and one landing. Armed helicopters will log a sortie in the landing zone on combat assault operations whether or not they actually land.

staging area - A geographic locality between the base camp and the objective of an airmobile force through which the parts thereof pass for refueling, regrouping, inspection and redistribution of troops, to continue operations more efficiently. Encompasses as a rule, forward logistical base, aviation fuel/arm facilities, AMF reserve, and aircraft laager area.

station time - Time in an airmobile operation by which all personnel and material must be loaded.

strip alert - Aircraft on the ground at a base or forward strip ready for take-off within 5 minutes. Usually denotes aircraft linked-up with combat troops/loads. In the case of armed helicopters, fully armed.

supporting aircraft - Support aircraft consist of all aircraft designated to provide combat, combat support, combat service support, or command and control service to a land force.

suppressive fires - Fires placed upon known or suspected locations of enemy troops, weapons, or likely enemy positions which, because of their proximity to the flight path, present an immediate or potential threat to Army aircraft movements. Suppressive fires are employed during a helicopter assault of an enemy position in order to greatly reduce effective enemy small arms and automatic weapon fires directed against the assault landings. Fires are provided by Army aircraft armed for the express mission of aerial fire support missions.

-T-

tactical air control party (TACP) (air control team) - A USAF team organized to coordinate and direct close air support strikes in the vicinity of forward ground elements by visual or other means. Usually assigned to combat battalion, brigade, division, or corps. Consists of a FAC, ALO, and communications personnel.

tactical air transport - The use of air transport in direct support of: airborne assaults; carriage of air transported forces; tactical air supply; evacuation of casualties from forward airfields and clandestine operations.

target analysis - An examination of potential targets to determine military importance, priority of attack and weapons required, to obtain a desired level of damage or casualties.

target bearing - 1. True - the true compass bearing of a target from a firing ship. The comparable field artillery term is azimuth. 2. Relative - the bearing of a target measured in the horizontal from the bow of one's own ship clockwise from 0 degrees to 360 degrees, or from the nose of one's own aircraft in hours of the clock.

terminal facilities - The capabilities within an aerial-supply delivery or loading area for the guidance of Army transport aircraft, air traffic control, loading or unloading of supplies of personnel, and the ground transport of air-delivered cargo or personnel.

-U-

unit aircraft - Organic aircraft provided an aviation unit.

-V-

VTOL aircraft - A category of aircraft with vertical takeoff and landing characteristics.

ABBREVIATIONS

-A-

AAF - Army airfield.

abn - Airborne.

acft - Aircraft.

ACL - Allowable cargo load.

ACP - Aerial control point.

AHP - Army heliport.

ALO - Air Force Air Liaison Officer.

ALOC - Air Line of Communication.

AM - Airmobile.

AMF - Airmobile Force.

AML - Airmobile Light (UH-1).

AMM - Airmobile Medium (CH-47).

ARWS - Aerial rocket weapons system.

ATC - Air traffic control.

ATGM - Antitank guided missile.

avn - Aviation.

-C-

CAS - Close Air Support.

CCP - Communications Check Point.

CE - Crew Chief.

CG - Center of Gravity.

-D-

DAVNO - Division aviation officer.

DGR - Door Gunner.

DTOC - Division tactical operations center.

DZ - Drop zone.

-E-

ETA - Estimated time of arrival.

ETD - Estimated time of departure.

ETE - Estimated time enroute.

-F-

FAC - Forward Air Controller (USAF).

FCC - Flight Coordination Center.

FFAR - Folding Fin Aerial Rocket.

FFS - Flight Following Station.

FOC - Flight Operation Center.

FSSE - Forward Service Support Element (1st Cav Div (AM)).

FW - Fixed-Wing (airplane)

-G-

GCA - Ground Controlled Approach.

-H-

HEL - Helicopter.

-I-

IFF - Identification, friend or foe.

IFR - Instrument Flight Rules.

IMC - Instrument Meteorological Conditions.

IR - Infra Red.

-L-

LCG - (See Loads Control Group.)

LOLEX - Low level extraction.

LZ - Landing Zone.

-N-

nav - navigation.

NDB - Non-directional Beacon.

-P-

Pfdr - Pathfinder(s).

Plt - Pilot

POL - Petroleum, oils, and lubricants.

PZ - Pickup Zone.

-R-

RP - Release point.

RR -- Radio relay.

RSP - Reconnaissance and security positions.

RW - Rotary Wing (helicopter).

-S-

SLAR - Side-looking Airborne Radar.

SSFFAR- Spin stabilized Folding Fin Aerial Rocket. (Modified 2.75" FFAR for use on helicopters).

STOL aircraft - A category of aircraft with short takeoff and landing characteristics.

-T-

TACC - Tactical Air Control Center (AF).

TACP - Tactical Air Control Party (AF), (Bn, Bde and Div).

TOC - Tactical Operations Center.

-V-

VFR - Visual Flight Rules.

VMC - Visual metrological conditions.

VR - Visual Reconnaissance.

APPENDIX II

ARMY AIRCRAFT

TABLE II-1

DIVISIONAL ARMY AVIATION

1. INFANTRY AND AIRBORNE DIVISIONS.

	OH-6	UH-1B Armed	UH-1B Unarmed	UH-1D	TOTAL
Aviation Battalion Gen Spt Co	4	6	0	2	12
Ambl Co (Lt)				25	25
Air Cav Trp	9	11	0	6	26
Bde Hq & Hq Co (3)	4	0	0	0	12
Div Arty Hq & Hq Btry	9	0	2	0	11
Spt Cmd Acft Maint Co	0	0	0	2	2
TOTAL DIVISION	34	17	2	35	88

2. ARMOR AND MECHANIZED DIVISIONS.

	OH-6	UH-1B Armed	UH-1B Unarmed	UH-1D	TOTAL
Div Hq & Hq Co	4	0	0	2	6
Air Cav Trp	9	11	0	6	26
Bde Hq & Hq Co (3)	4	0	0	0	12
Div Arty Hq & Hq Btry	9	0	2	0	11
Spt Cmd Acft Maint Co	0	0	0	2	2
TOTAL DIVISION	34	11	2	10	57

II. 1 GENERAL. Only light observation helicopters and utility helicopters are authorized at division level (Table II-1), with the exception of the airmobile division where the OV-1B and C Mohawk and CH-47A Chinook are in the TOE. The airmobile division is also augmented with the O-1F Birddog and heavy lift CH-54A helicopter. All divisional and non-divisional aircraft authorized today will be discussed in this section. The discussion is limited to information needed by the ground commander to properly utilize these aircraft.

a. The official designation, to include classification code, and basic mission and type symbols of all Army aircraft can be found in AR 700-26 and FM 1-100.

b. The performance data stated in this section originates from flight test programs and operational experiences gained through actual employment, as well as digested from appropriate handbooks on each aircraft. Experiences gained in Vietnam are used to highlight performance characteristics under combat conditions. Design performance data on all Army aircraft can be found in the Infantry Reference Data, USAIS.

II. 2 . UH-1D IROQUOIS.

a. Description.

(1) The UH-1D helicopter (Figure II-1) is a compact, turbine-powered, utility helicopter. A wide cargo-troop compartment permits the helicopter to be used in a variety of services, but it is primarily used to transport troops, light equipment and supplies about the battlefield and is the standard aeromedical evacuation helicopter.

(2) The skid-type landing gear allows a ground clearance of only 15 inches, therefore particular attention must be paid to proper clearance of the landing zone (LZ) and selection of landing points to avoid damage to the helicopter.

b. Crew and Troop Configuration.

(1) Design crew configuration. This helicopter was designed to operate with only the aviator under normal conditions, or an aircraft commander (AC) and co-pilot (CP) when the mission required, or the aviator and medical attendant when configured for aeromedical evacuation.

(2) Combat crew requirements. Under combat conditions the helicopter will habitually be manned by the aircraft commander (AC), co-pilot (CP), crew chief (CE), and door gunner (DGR).

(3) Troop configuration. The UH-1D is designed to carry 12 combat troops. However, under most operating conditions, and especially in South Vietnam, rarely will the UH-1D lift a combat squad due to the addition of protective armor plating, weapons subsystems, crew requirements, and general atmospheric conditions.

The three basic troop seating arrangements are shown in Figures II. 2, II. 3, and II. 4. The decision as to which configuration to use will depend on the mission or combination of missions the helicopters will perform. The aviation commander will configure the troop seating to the mission, unless the ground commander makes a specific request for a special configuration to meet mission requirements. Alterations of these basic arrangements can be made for a combination troop and cargo load.

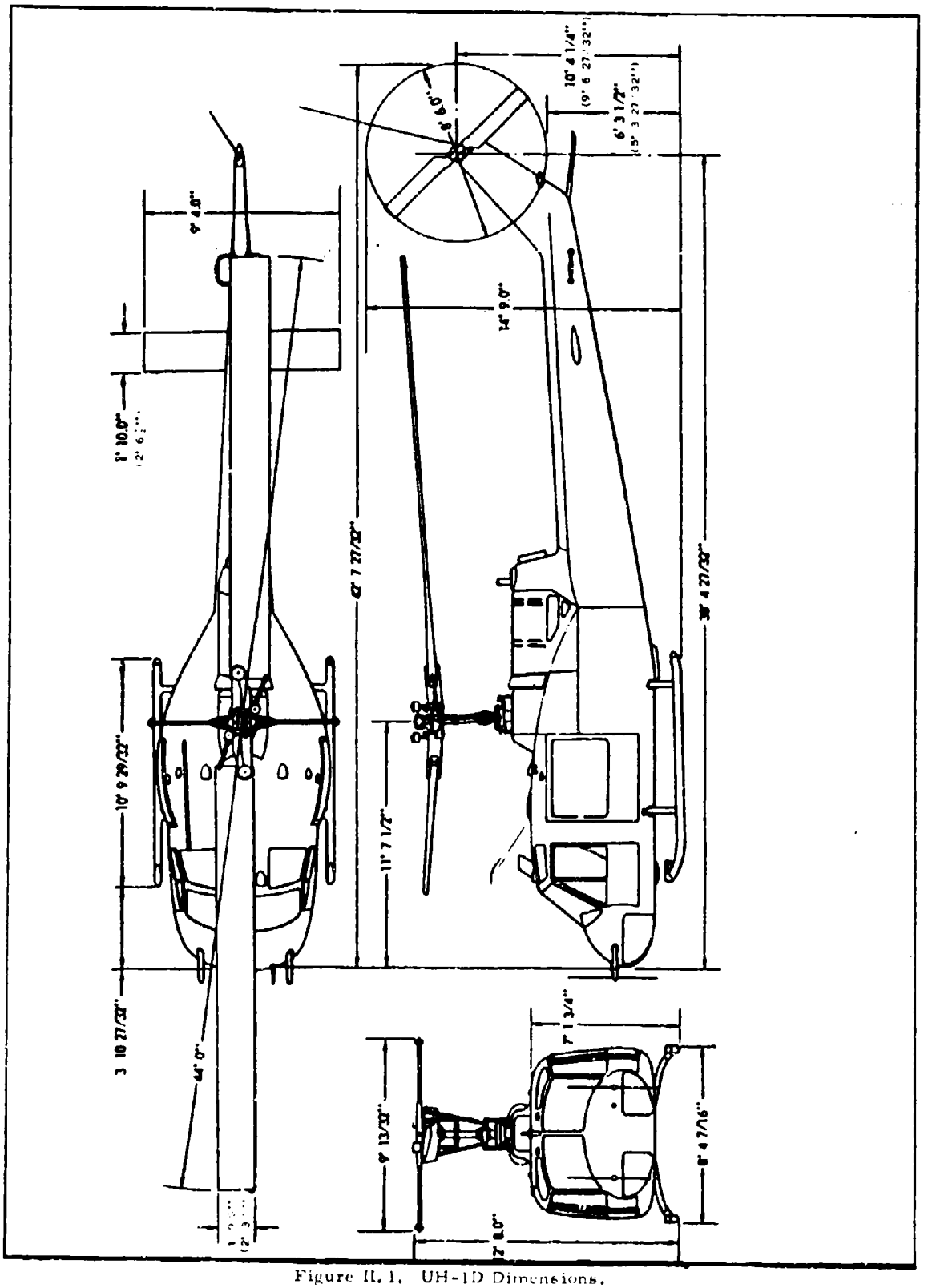


Figure II. 1. UH-1D Dimensions.

(4) Crew/troop allowable cargo load factors. In addition to consideration of the desired troop seating configuration; the factors that effect crew/troop ACL must be taken into account.

(a) The first factor is the number of crew personnel required for the mission. As previously stated, the UH-1D is manned by the AC and CP in a combat situation. This is tactically sound inasmuch as it allows double insurance if one aviator is injured; secondly, a quick glance at the problems involved in placing a combat-equipped soldier in the CP seat will point out the inherent disadvantages of use of this seat. The CE, a vital crew member, in addition to being readily available for on the spot repairs, also doubles as a door gunner. The gunner, the fourth crew member, is vital to the security of the helicopter. The size of the crew may be altered by unusual tactical situations, and requirements for maximum troop ACL. Due consideration must be given to the security of the LZ/PZ and the formation of the aircraft before any decision is made to eliminate a crew member. The determination of crew reductions must be based on a mission-by-mission basis. The final authority to reduce the crew will rest with the airmobile force (AMF) commander, based upon recommendations of the aviation commander.

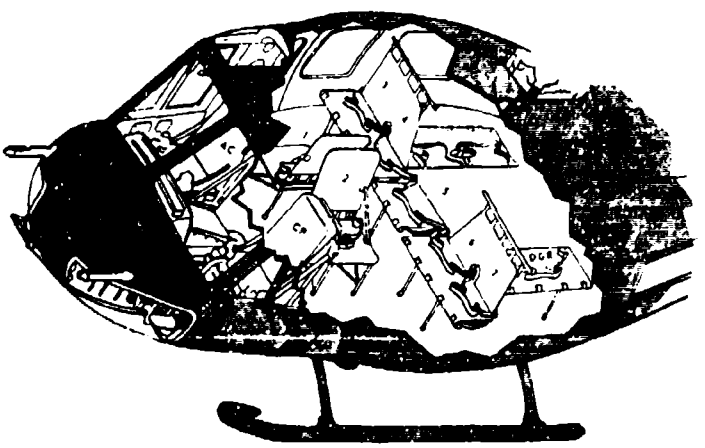


Figure II. 2. UH-1D 7 Troop Configuration.

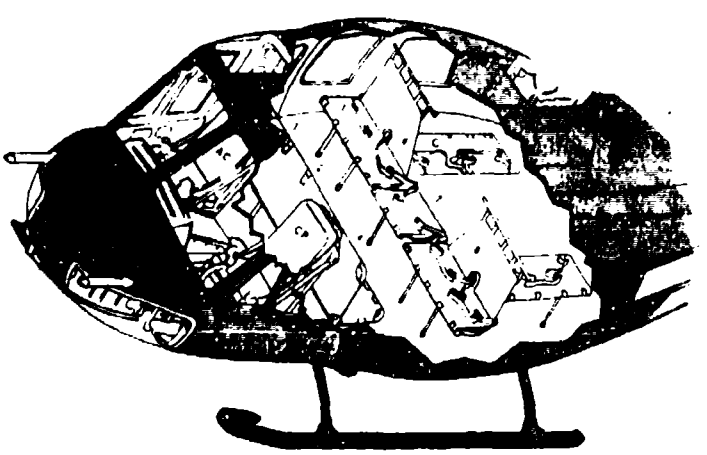


Figure II. 3. UH-1D 9 Troop Configuration.

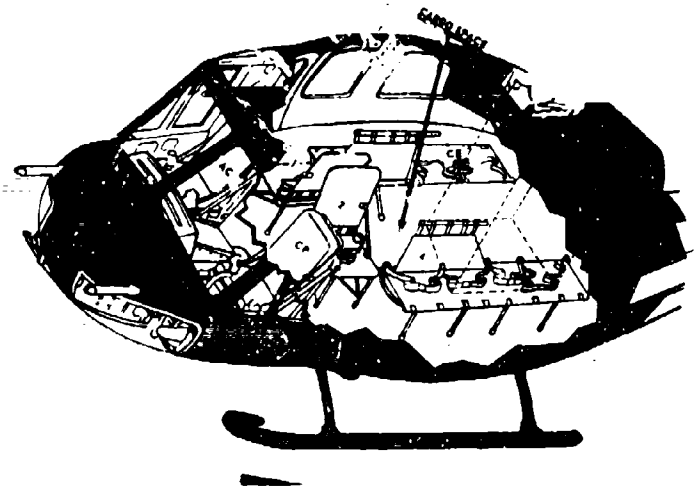


Figure II. 4. UH-1D 6 Troop Configuration.

(b) The second factor is density altitude. See Paragraph 3.2d.

(c) The size of the LZ/PZ in relation to the surrounding obstacles is a factor which will drastically influence the ACL. The UH-1D, like all air vehicles, can carry a larger pay load when given a longer take-off/landing run. The professional advice of the supporting aviation commander must be relied upon in this area, but the supported commander must be aware of this factor during the initial planning phases and throughout subsequent operations.

(d) The ACL may be increased by decreasing the fuel load when refueling is not a critical problem. Subsequent sorties without refueling will allow for equivalent increases in the ACL and loading plans should be prepared to take maximum advantage of this factor. A reduction of the fuel load is more acceptable than a crew reduction and should be considered first.

(5) Aeromedical evacuation configuration. The UH-1D is designed for 6 litter patients and a medical attendant. (Figure II. 5.) Experience in Vietnam has altered this configuration of three litter patients, medical attendant and CE. (Figure II. 6.) This latter configuration gives a great operational latitude and, places all litter patients in a position to be cared for by the medical attendant.

c. Cargo Configuration. Removal of the troop seats provides unrestricted space for cargo or equipment. (Figure II. 7.)

(1) General cargo features. Cargo loading area, dimensions, location of tie-down fittings, and other cargo features are shown in Figure II. 8.

(a) Cabin area. An area of approximately 220 cubic feet is available for normal cargo or straight-through cargo loading. Cargo can be loaded through the cargo compartment to allow for overhang, but this will require securing of the cargo.

(b) The hinged panel doors will be removed and the main doors locked to the rear on a combat assault (CA) to provide for ease of loading/unloading.

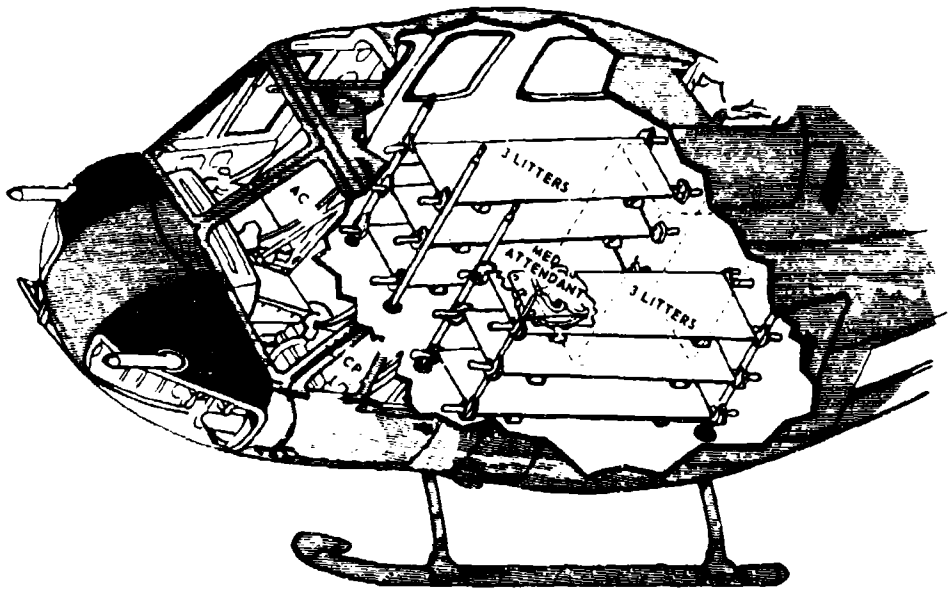


Figure II. 5. UH-1D 6-Litter Patient Configuration.

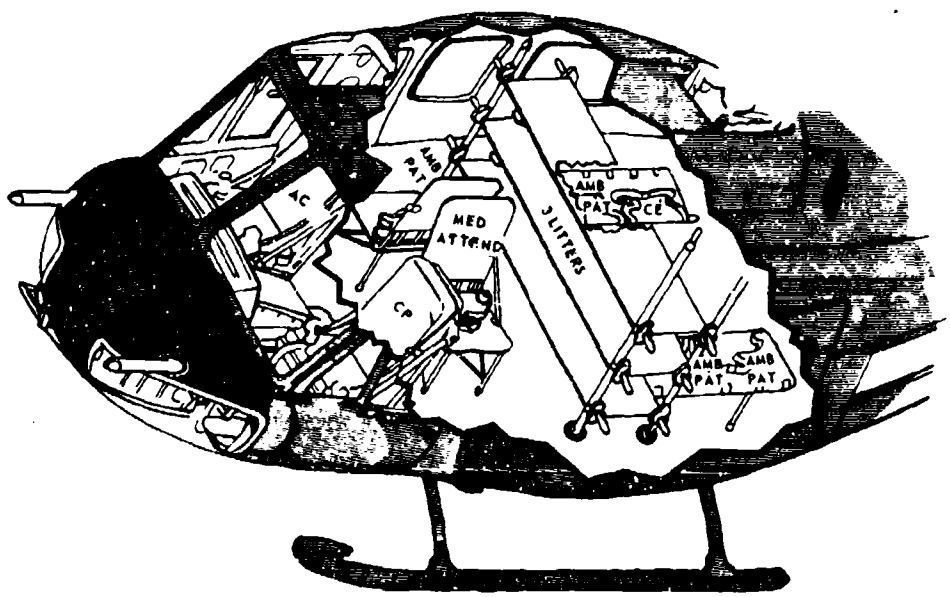


Figure II. 6. UH-1D 3-Litter Patient Configuration.

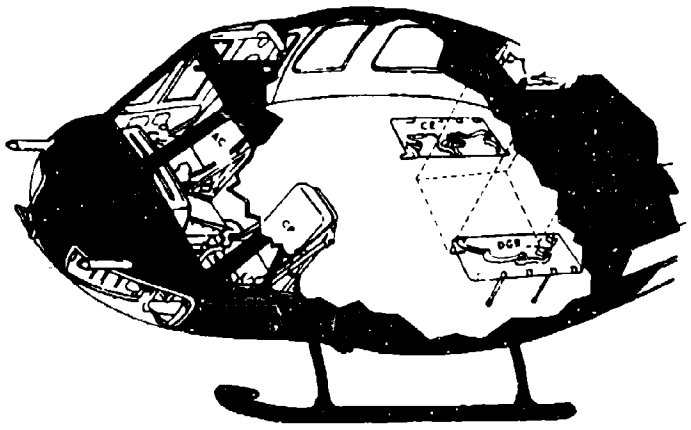


Figure II.7. UH-1D Cargo Configuration with Crew.

(c) Cargo tie-down equipment. Tie-down equipment is not normally carried in the UH-1D; therefore the ground commander must request this equipment through his S4 or state in the mission request that the aircraft should report with doors to allow cargo to be loaded without use of tie-downs by closing the doors.

(2) Preparation of aircraft and cargo for loading and unloading.

(a) Cargo loading aids. The large cargo doors, accessible loading area and low floor level preclude the need for special loading aids.

(b) Preparation of general cargo. The supported unit will assemble the cargo to be transported, and compile the data covering weight, dimensions, and CG locations to insure ACL is not exceeded. (See TM 57-210 for weights and dimensions of major items of equipment.)

(c) Loading procedure. The helicopter requires no special loading preparation other than folding or removal of seats. Heavier cargo should be loaded against the transmission bulkhead (or near the center of gravity). Supervision of load distribution will be accomplished by the crew.

(3) External cargo suspension unit. (Figure II.9.)

(a) The suspension unit is designed for 4,000 pounds, however, a more realistic planning figure is 1000 to 1600 pounds. The procedures for rigging and hook-up of cargo are discussed in TM 55-450-8.

(b) Rigging equipment for sling loads must be obtained by the user from the unit S4.

(c) The distance from the 10" nylon ring, which attaches to the helicopter suspension hook, to the rigged load must not exceed 8' when the load is suspended.

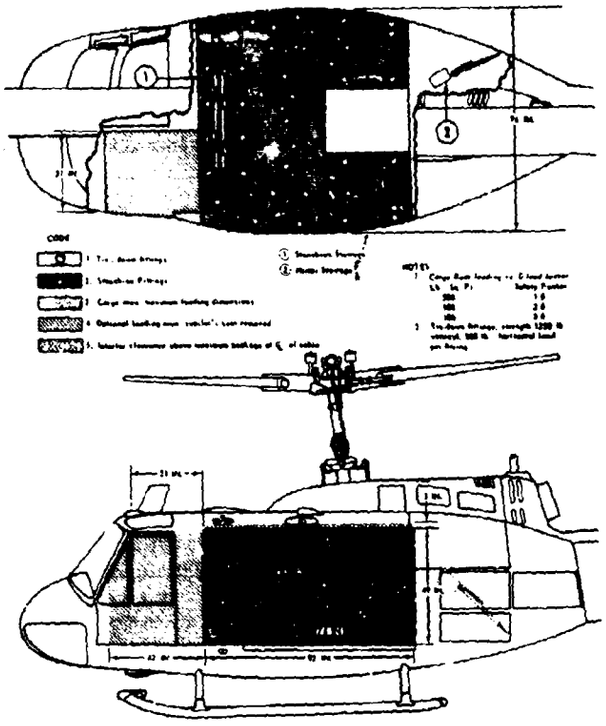
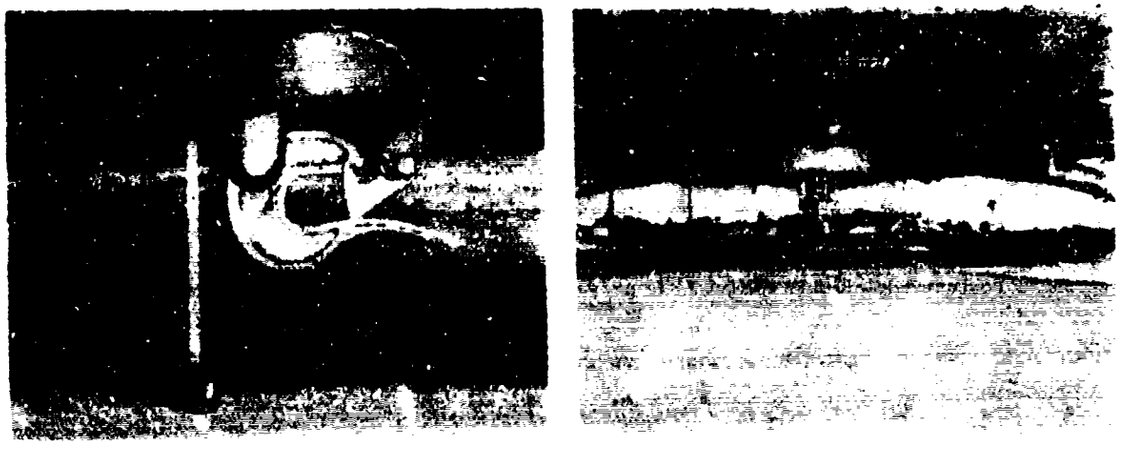


Figure II.8. UH-1D Cargo Area and Tie-Down Fittings.



Side View Front View

Figure II.9. UH-1D External Cargo Suspension System.

d. Armed Configuration. The UH-1D will accept two semi-permanent mounted M-23, 7.62mm machineguns. The guns are utilized in the suppressive fire role and are not intended to make the UH-1D a fighting platform. On initial combat assaults this firepower can be utilized to augment armed helicopter firing runs.

e. LZ/PZ Requirements. To take maximum advantage of the UH-1D's vertical flight capabilities the user must follow the guides established in Paragraph 6.17 when selecting LZ/PZ's.

II.3 UH-1B IROQUOIS.

a. Description. The UH-1B can be used in the same variety of services as the UH-1D, but it is used primarily as an armed helicopter. A newer version of the UH-1B, equipped with the model "540 door hinge rotor system" is currently in action in Vietnam. This improved rotor system has substantially increased performance over the older standard rotor configuration. The aircraft with the "540 system" has been designated the UH-1C.

b. Crew and Troop Configuration.

(1) Crew configuration. The crew configurations for the UH-1B are identical to the UH-1D. The determination of crew requirements, in the armed role, rests solely with the aviation commander.

(2) Troop configurations. When employed in a troop-lift role, the helicopter main armament subsystems must be removed. The removal of armament systems requires time and causes increased wear on the mounting points as well as the weapons. Therefore, this should be carefully weighed prior to reconfiguring from the armed to troop-lift role. The UH-1B can be configured to carry five combat troops, with a crew of four.

(3) Crew/troop ACL factors. These factors are subject to the same considerations as discussed for the UH-1D.

(4) Aeromedical evacuation configuration. The UH-1B can be configured for this mission utilizing an arrangement similar to Figure III.6. The lift capabilities are reduced to three litter patients only, a medical attendant, and the CE. In the armed configuration the UH-1B can be used for limited emergency medical evacuation.

c. Cargo Configuration. The UH-1D discussion on the general cargo features, preparation of the aircraft and cargo, and external cargo suspension unit is applicable to the UH-1B; considering the reduction in the cargo compartment size. The CG limits can be exceeded more readily by forward loading, therefore, extreme caution must be taken to insure all heavy items are loaded aft.

d. Armed Configuration. The UH-1B is capable of accepting numerous armament subsystems by external, hard-point mounting, nose mounting, or by placement of subsystems within the cargo/troop compartment with a fixed or semi-fixed mounting system. Employed in the armed configuration the UH-1B has proved an effective weapons system in its combat role in Vietnam.

(1) The UH-1B can be armed with one or a combination of the following systems:

(a) M3, 2.75 Inch Folding Fin Aerial Rocket (FFAR).

(b) M6, Quad 7.62mm Machine Gun.

(c) M22, Anti-Tank Guided Missile (ATGM).

(d) M5, 40mm Grenade Launcher.

(e) M16, 7.62mm Machine Gun, and 2.75 Inch FFAR systems.

(2) See Chapter 6.

e. LZ/PZ Requirements. The LZ/PZ requirements for armed UH-1B's will be determined by the aviation commander, or armed flight leader. See Paragraph 6.17 for requirements in selection of LZ/PZ's when used in the troop/cargo roles.

II.4 LOH.

a. OH-13 and OH-23. The OH-13 Sioux and the OH-23 Raven are the LOH's common to Army units worldwide. These two LOH's are basically the same and can be employed in a variety of like roles.

(1) The OH-13 manufactured by Bell, has been the Army's standard LOH since the Korean War. Designed for operation in confined areas of the combat zone, it can carry one passenger, or two litter patients in external litter pods, or 400 pounds of cargo. The OH-13 is a multi-purpose helicopter used for small unit command and control, wire laying, medical evacuation, radiological survey, light resupply missions, and as an armed scout air vehicle in the air cavalry troop.

(2) The OH-23, manufactured by Hiller, was designed as a three-place helicopter, however the combat load is the aviator and one passenger. The OH-23 performs the same missions as the OH-13.

b. OH-6A. (Figure II.10.) The OH-6A will not be in all Army units for several years, but is programmed for Vietnam in 1967.

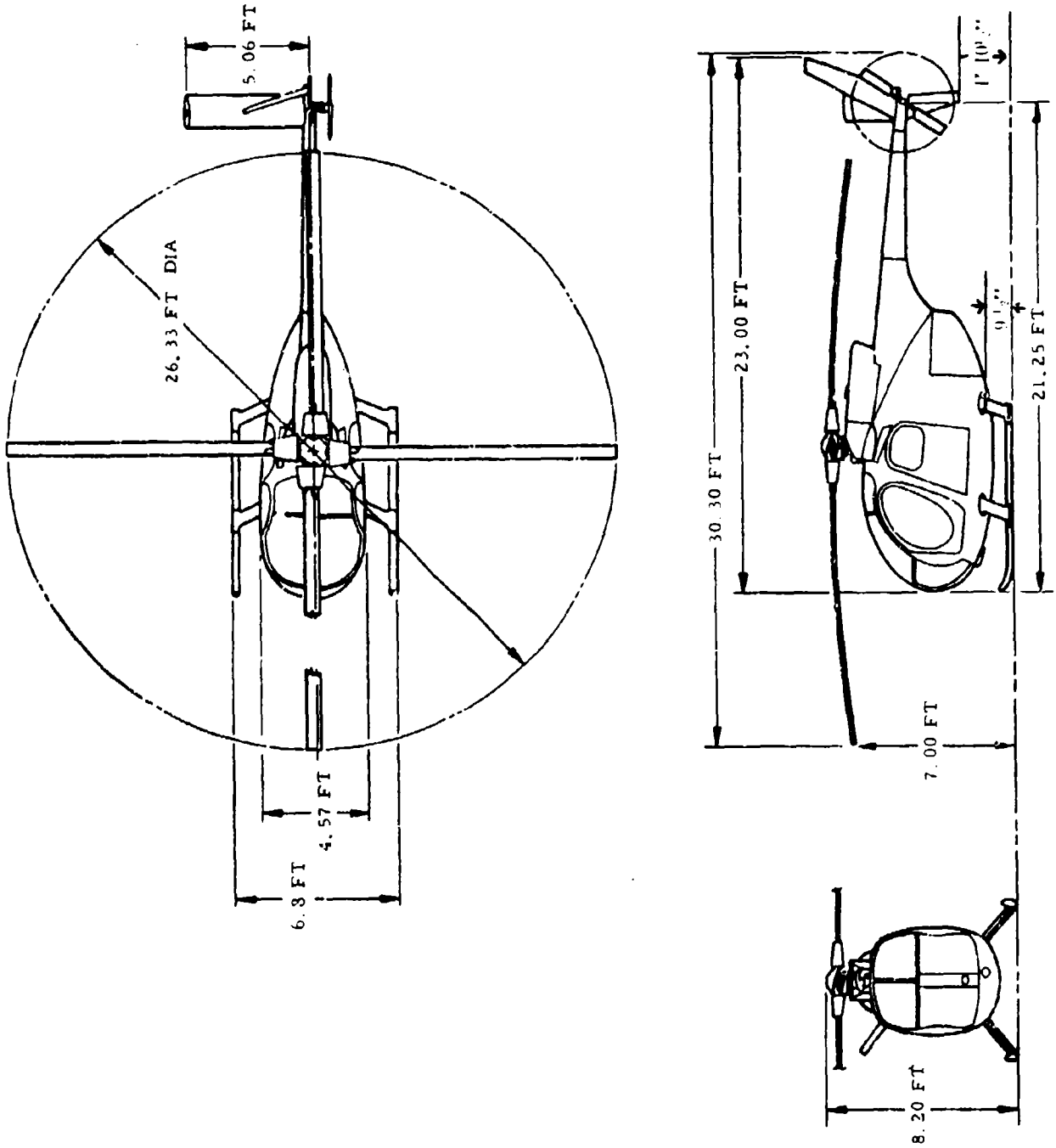


Figure II. 10. OH-6A Dimensions.

(1) Description.

(a) The OH-6A, manufactured by Hughes, is basically an all metal, single turbine engine LOH, with a four-bladed main rotor. The OH-6A will be the Army's primary light observation aircraft and will replace the O-1 Birddog, the OH-13 and OH-23. (Figure II. 11.)

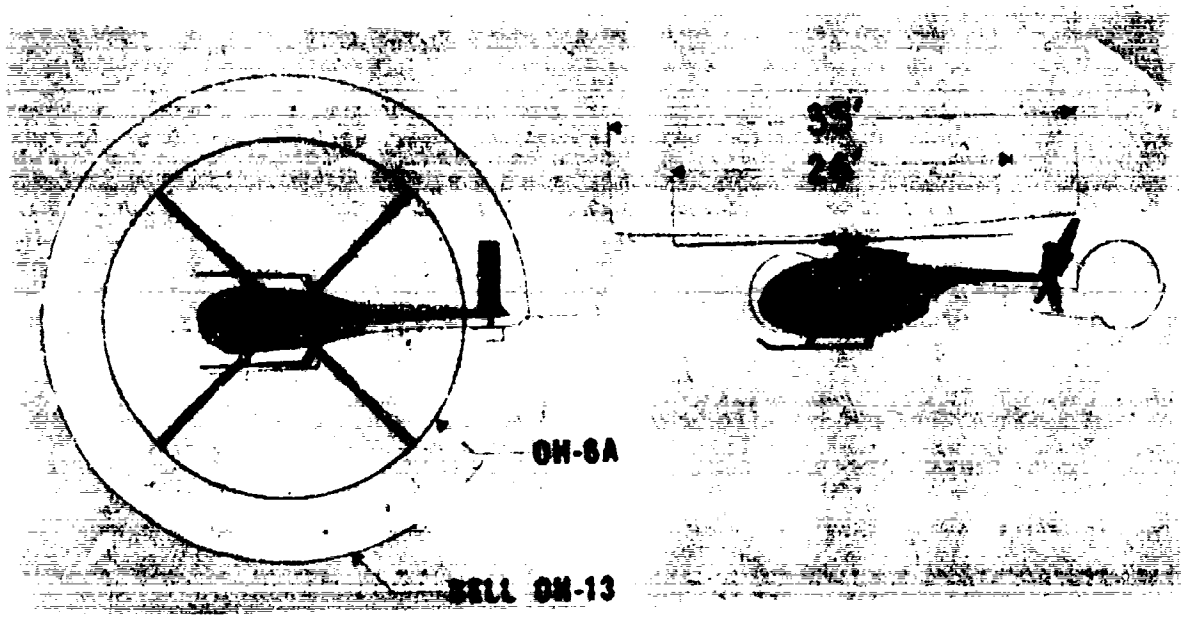


Figure II. 11. OH-6A Size Comparison.

(b) The crew stations are enclosed in a transparent (non-bullet proof) plastic canopy. Doors are provided on the sides of the fuselage, next to each crew station, permitting direct entry.

(2) Crew and troop configuration.

(a) Crew configuration. The minimum crew requirements for all combat missions consist of the aviator, stationed on the right side. Combat experience may dictate a crew of two or three, particularly in the armed role (AC, CP, and CE). An aerial observer is added as a second crew member on missions that require a trained observer.

(b) Troop configuration. The standard seating arrangement consists of two troop seats in the troop compartment and the left front crew seat. In high density operations the troop compartment seats can be removed and four combat equipped troops can be seated on the floor for a total of five troops. (Figures II. 12a and b.)

(c) Medical evacuation configuration. The OH-6A will transport two litter patients or three ambulatory patients, or a combination not to exceed three. (Figure II. 12c.) The medical attendant, in the left front seat, is within reach of patients for enroute treatment.

(a) Four Soldiers in Aft Compartment for Total of 5.

(b) A Company Can Be Lifted Across An Obstacle in 30 Minutes.

(c) Emergency Medical Evacuation.

(d) Cargo Can Include Two 55-Gallon Drums.

(e) 1,350-lb Capacity "Flying Crane".

(f) OH-6A's in C-130 Transport Airplane.

Figure II.12. OH-6A Transport Missions.

(3) Cargo configuration.

(a) General cargo features. The cargo compartment has a volume of 40 cubic feet, and a capacity of 950 pounds. (Figure II. 13.)

(b) Preparation of aircraft and cargo for loading and unloading. The supported unit will compute all loading data and load cargo under the supervision of the aviator to insure that the ACL is not exceeded. The location of the desired CG is directly under the mast system. It is highly improbable that the CG limits will ever be exceeded as long as the cargo is within the ACL.

(c) Securing loads. The procedures for securing all types of loads are the same as for any helicopter.

(d) An external sling system is under development that will allow short haul movement of cargo up to 1, 350 pounds. (Figure II. 12e.)

(e) Long distance displacement of the OH-6A is facilitated by the folding rotor blades. (Figure II. 16.) Upon arriving at destination the aviator can swing the blades into position and fly away without any further maintenance assistance.

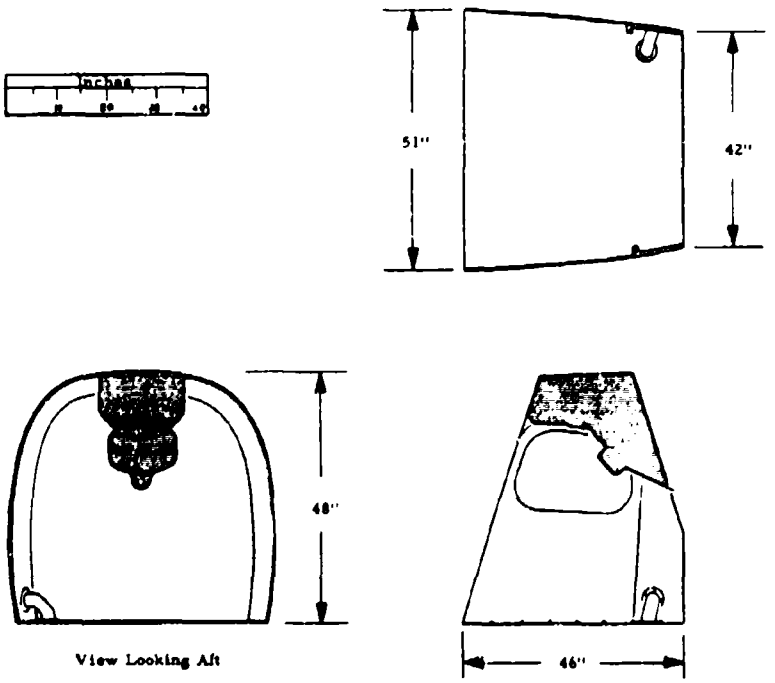


Figure II. 13. OH-6A Cargo Compartment Dimensions.

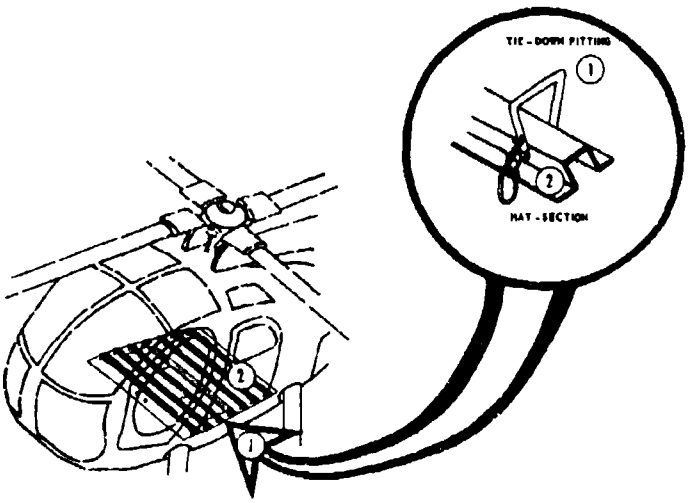


Figure II. 14. OH-6A Cargo Tie-Down Fitting Locations.

(4) Armed configuration. The OH-6A has provisions for the installation of the XM27 or XM8 weapons systems. The hard points for installation of the armament subsystems are located on the left side of the helicopter only, and are primarily a suppressive fire weapons subsystem, except when used in the scout role (air cavalry troop).

(5) LZ/PZ requirements. (Figure II. 16.) Because of its power per pound ratio and the ability of the OH-6A to go from 0-60 knots in 5 1/2 seconds, it is capable of operating from LZ/PZ's only twice as large as the rotor blade diameter. See Paragraph II. 16.

Figure II. 15. OH-6A Blades Folded.

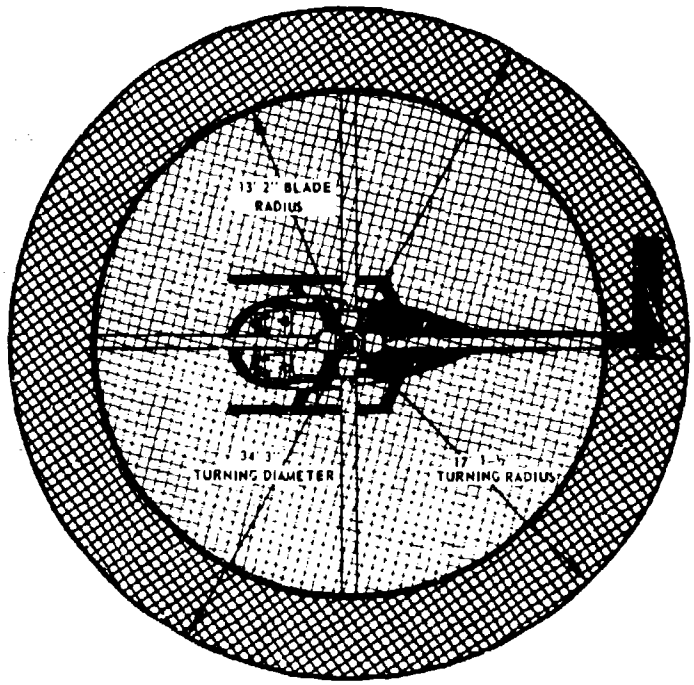


Figure II.16. OH-6A Minimum Turning Radius.

(6) Combat area survivability. Improved survivability factors have been built into the OH-6A, based on combat data compiled from employment of the OH-13 and OH-23 in Vietnam. Factors directly contributing to the high combat area survivability of the OH-6A include:

(a) Minimum vulnerable total area.

1. Small size.

2. No small-diameter, vulnerable, cable controls.

3. No vulnerable hydraulic power controls or electronic stabilization systems.

4. Engine oil tank and cooler are concentrated close together.

5. No separate main transmission oil tank or cooler.

6. No intermediate tail rotor drive shaft bearings or gearboxes.

(b) High, 123-knot, forward speed capability and high maneuverability greatly reduce the possible aiming accuracy of enemy hand-held weapons.

(c) Small size and high maneuverability permit operations to obtain maximum screening from available cover by flying map-of-the-earth.

(d) With quality armament, ground troops are less likely to engage a helicopter that can provide a high volume of return line.

(e) The OH-6A incorporates self-sealing fuel cells against 7.62mm projectiles for the lower 50 percent of the fuel cell.

(f) Armor seats and other appropriate passive protection against 7.62mm threats are provided for the OH-6A crew and vital aircraft components at the expense of only 135 pounds.

II.5 CH-47A CHINOOK. The CH-47A is organic to Infantry Divisions (Airmobile) and corps and field army aviation units. The primary mission is to lift artillery units and high density supplies and equipment.

a. Description (Figure II.17). The CH-47A helicopter, commonly called the CHINOOK, is manufactured by Boeing. It is a tandem-rotor helicopter, designed for transportation of artillery, cargo, and troops during day, night, visual and instrument conditions. The Chinook is powered by two turbine engines mounted on the aft fuselage. The engines simultaneously drive the two tandem, 3-bladed rotors. A pod on each side of the fuselage contains sufficient fuel for two hours of flight time. It requires a higher ratio of maintenance manhours for each hour of flight time than utility or observation helicopters; therefore, sound mission planning is required.

b. Crew Requirements. The crew requirements are varied per mission; however, the combat crew consists of the AC, CP, CE, and DGR.

c. Cargo/Troop Configuration.

(1) The cargo compartment dimensions are uniform throughout. (Figure II.18.)

(a) Troop seating. (Figure II.19.) The combat troop load is 30 fully equipped troops. To completely utilize the troop lift capability in combat, 10 additional troops may be seated on the floor using cargo tie-down straps. For optimum utilization, a combination of troops and cargo up to the mission ACL is desired. To avoid accidental damage to the drive tube running along the top center of the cargo compartment, all weapons should be locked or unloaded while on board and secured by the individual. When troops carry full field equipment seat-back rests should be removed to avoid entanglement with the equipment. The correct way to enter and exit the Chinook is 90° to the rear ramp, to avoid low blades in front and the heat (in excess of 500°F) coming from the engines. Troops must not unload until directed to do so by a crew member to avoid sudden shifting of the CG limits to the rear.

(b) Litter arrangement. (Figure II.20.) Two 1-man seats are provided for medical attendants. It is not necessary to remove troop seats in order to install litters. The helicopter is rigged by the crew in approximately 30 minutes for aeromedical evacuation. If the helicopter is to be loaded with a combination of patients, the litter patients are positioned to the rear.

(2) Cargo door and ramp. (Figure II.20.) The cargo door telescopes into the ramp when lowered, and is an integral part of the ramp. When lowered the ramp inclines downward to maintain a uniform 78-inch overhead clearance. A continuous hinge runs the entire width of the aft upper edge of the ramp to attach the auxiliary loading ramps. The auxiliary ramps unfold to bridge the gap between the ramp and the ground for vehicles, and can be adjusted to various vehicle widths.

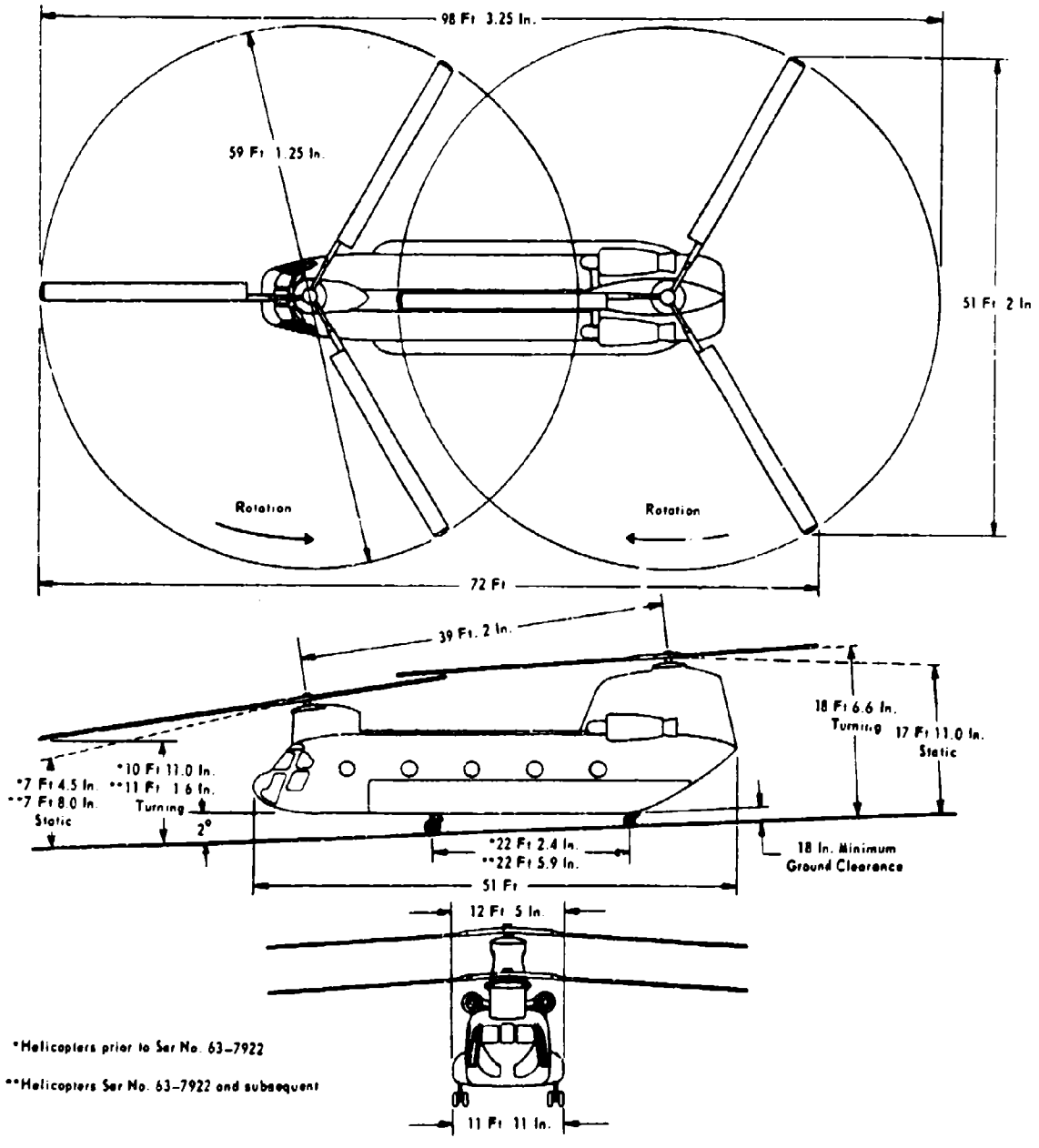


Figure II. 17. CH-47A Chinook Overall Dimensions.

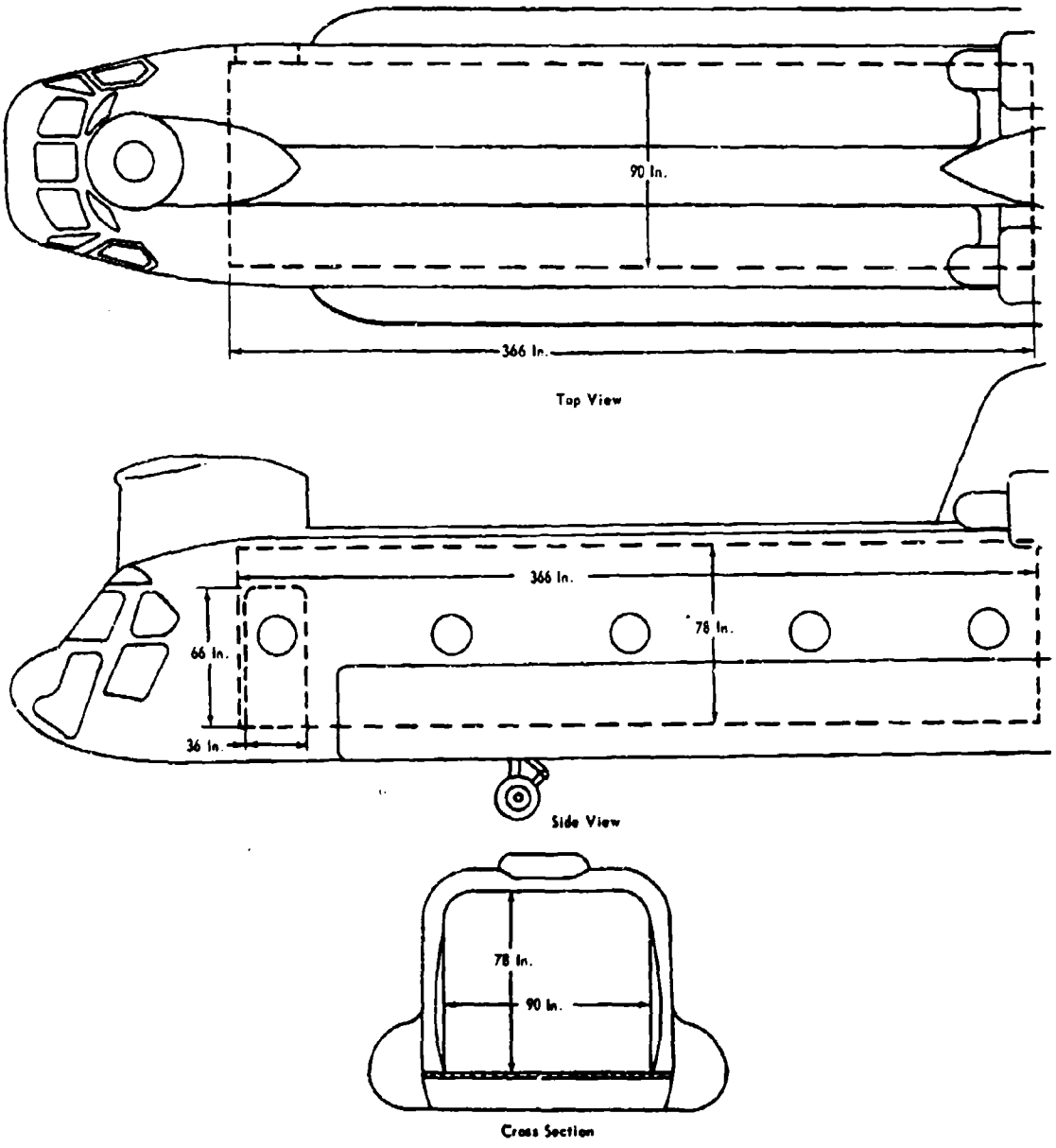


Figure II. 18. CH-47A Cargo Compartment Dimensions.

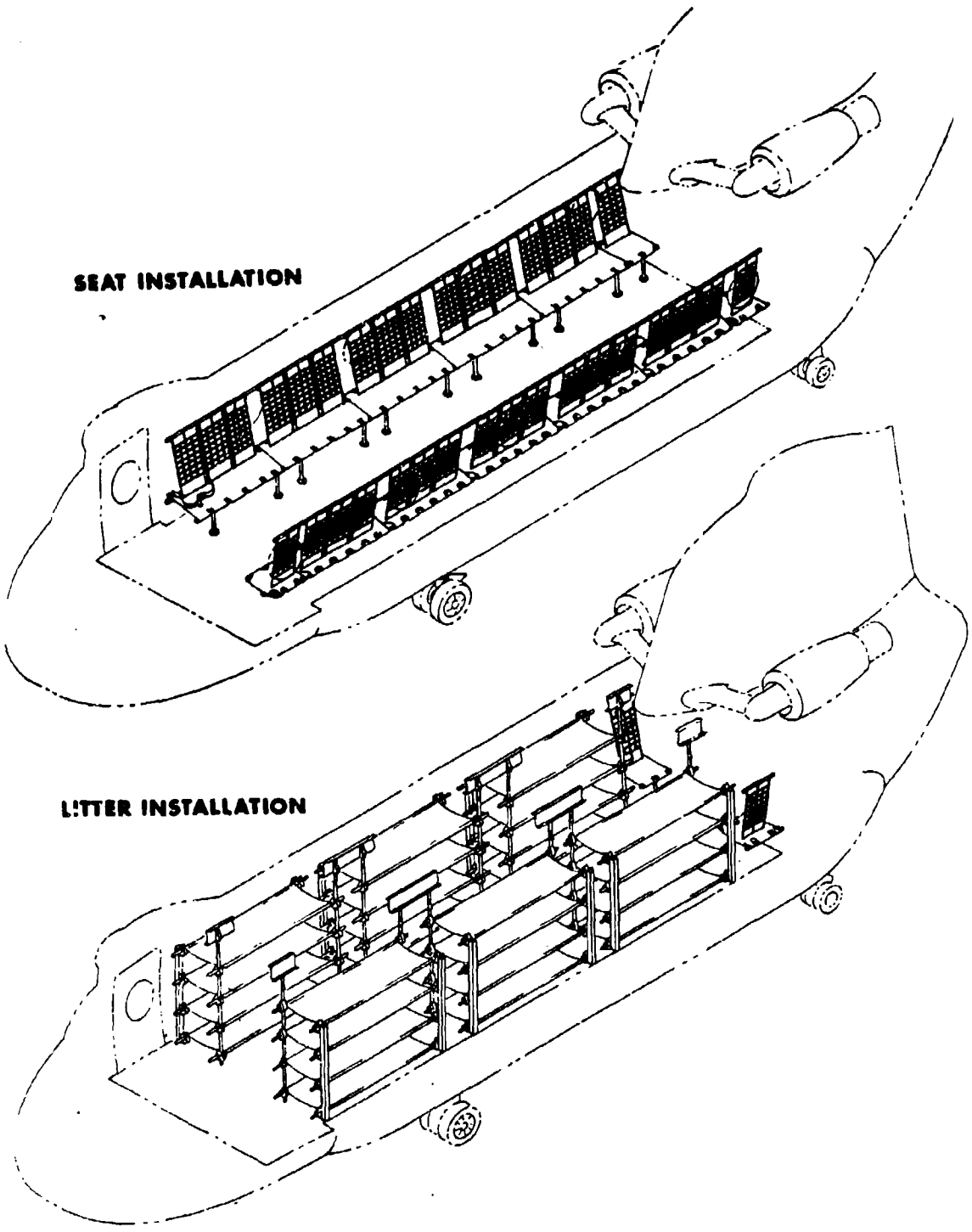
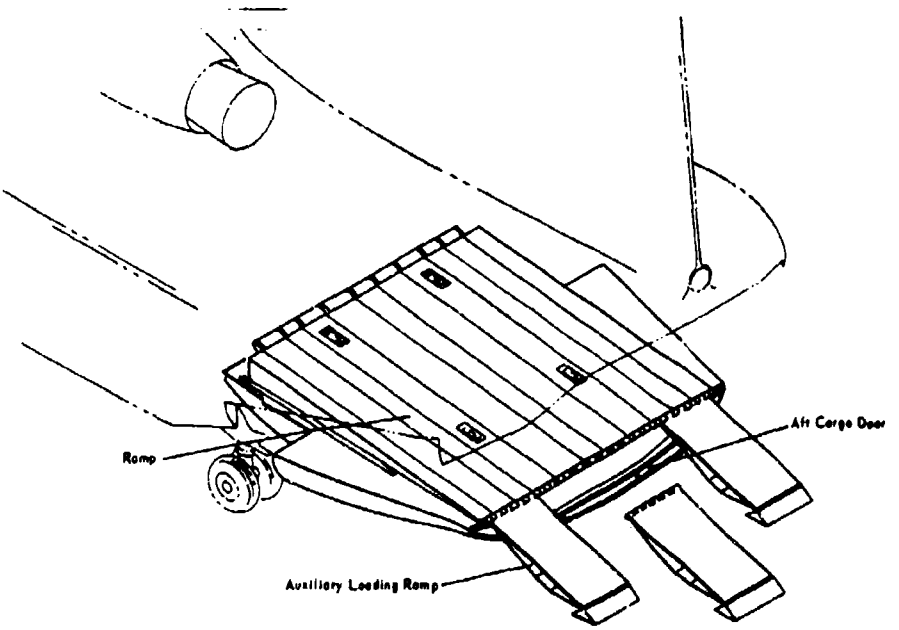
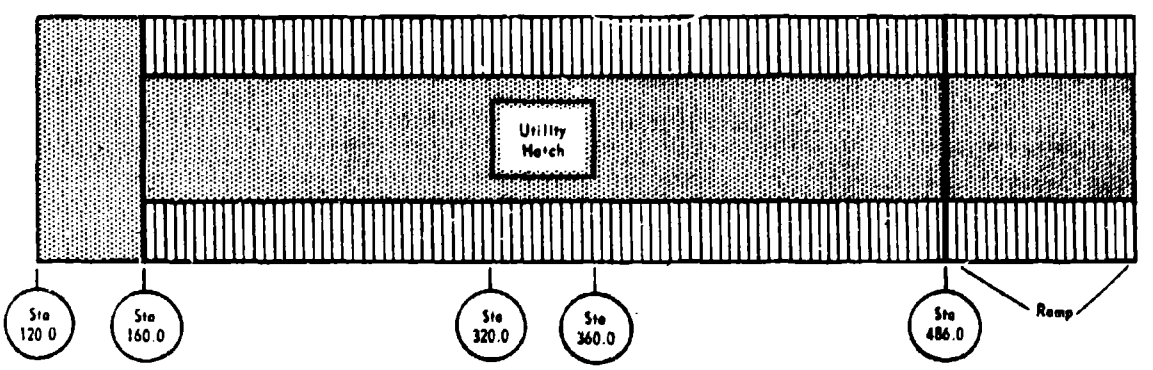


Figure II. 19. CH-47A Troop and Litter Configuration.

(3) Utility hatch door. (Figure II. 20.) A second trooper ladder is lowered through this door when employed on a trooper ladder mission.

(4) Cargo compartment floor. (Figure II. 21.) Sections on either side of the floor center-line are strengthened for vehicle treadways. The flooring is covered with a walkway compound which provides a non-skid surface for personnel and vehicles. The ramp floor is identical in construction to the cargo floor.





Code		Distributed Load (Cargo Floor) PSF	Distributed Load (Ramp) PSF	Concentrated Load (Cargo Floor and Ramp) LB
	Treadways	300	300	2500
	Walkway	300	300	1000

Notes: 1. When the ramp is level with the cargo floor, the total load is not to exceed 3,000 pounds.
2. Cargo is not to be loaded forward of station 160.00.

Figure II. 21. CH-47A Cargo Floor and Ramp Capacities.

(a) Strength areas. (Figure II. 22.) The weight variations which the floor supports are due to differences in strength of supporting frames and fuselage construction. In order to gain the maximum benefit from the cargo compartment floor, the following definitions and weight limitations must be observed.

1. Uniformly distributed load. Uniformly distributed loads are those loads wherein the total weight of the item is equally spread over the item's entire contact area.

2. Uniformly distributed load limits. The cargo compartment is divided into three compartments. (Figure II. 26.) The cargo ramp is compartment "F" when used as an extension of the cargo compartment. Compartment designations and limits are stenciled on the walls.

3. Concentrated loads. Concentrated loads are those loads wherein the total weight of the item is not equally spread over the item's entire contact area.

4. Concentrated load limits. Concentrated loads can be loaded on the treadways and on the walkway; the treadways aft of station 160. 0 can be loaded to a total wheel load of 2, 500 lbs; the treadways forward of station 160. 0 and the walkway can be loaded to a total wheel load of 1, 000 lbs. Concentrated loads are not to exceed 75 pounds per square inch for pneumatic tires or 50 pounds per square inch for block or roller-type wheels. The minimum distance, in feet, between the centers of any two adjacent concentrated loads is determined by totaling the adjacent loads and dividing by 1, 000.

(b) Load limits. Cargo exceeding limitations may be loaded with the use of shoring, provided weights remain within the ACL. In cases where the wheels of a vehicle cannot rest on both treadways because of a narrow wheel tread, shoring must be used. (See TM 57-210.) General cargo must not exceed floor pressure of 300 psf. To determine floor pressure of various loads divide the weight of the load by the area in square inches or square feet of contact surface.

COMPARTMENT	MAXIMUM FLOOR LOADING	FLOOR AREA	MAXIMUM CAPACITY
C	300 PSF	76.25 SQ FT	22,875 LBS
D	300 PSF	76.25 SQ FT	22,875 LBS
E	300 PSF	76.25 SQ FT	22,875 LBS
F	**300 PSF	*61.8 SQ FT	3,000 LBS

NOTES: *Area of the ramp is based on the ramp being open and level with the floor.

**300 pounds per square foot can be loaded on the ramp; however, the total load is not to exceed 3,000 pounds when the ramp is level with the cargo floor.

Figure II. 22. Compartment Capacities.

(5) Compartment capacities. (Figure II.22.) Based on a maximum distributed floor loading of 300 psf, the compartment capacities can be obtained by multiplying the floor loading by the floor area of the individual compartment.

(6) Tiedown fittings. (Figure II.23.) Tiedown fittings are of the D-ring type and must be used with tiedown devices that will not exceed the limits of the fitting.

(7) Restraint devices. (Figure II.24.) These devices are explained in TM 57-210.

(8) Cargo loading aids. The major aids are:

(a) Cargo door and ramp with auxiliary loading ramps. Paragraph 1.8c(2).

(b) A 3,000 pound capacity hydraulically operated winch with a capability of 12,000 pounds with the aid of pulley blocks.

(9) Hoisting system. A 600 pound capacity hoisting system is available for air rescue and aerial loading/unloading of light cargo through the utility hatch (Figure II.25).

(10) Cargo hook system. A 10,000 pound capacity cargo hook is provided for external loads. The position of the cargo hook is such that the load is suspended beneath the center of gravity of the helicopter.

(11) External cargo loading. (See TM 55-450-8.) Which should be used - internal or external loads? Troop loading is quite obvious, however, weapons and cargo require a second consideration. The easier and most efficient of the two methods is the external load. There are may reasons for this:

(a) Time is greatly reduced in loading and unloading.

(b) Loads can be picked up from the user location and delivered to the next required operating site. An artillery tube, for example, is efficiently moved from firing site to firing site in a minimum of time and with little effort.

(c) The size of loading/unloading crews is greatly reduced. Two men, a hook-up man and ground guide, are all that are required to move by external load.

(d) Loads can be moved from point to point in landing sites where it is not possible to touchdown for loading or unloading.

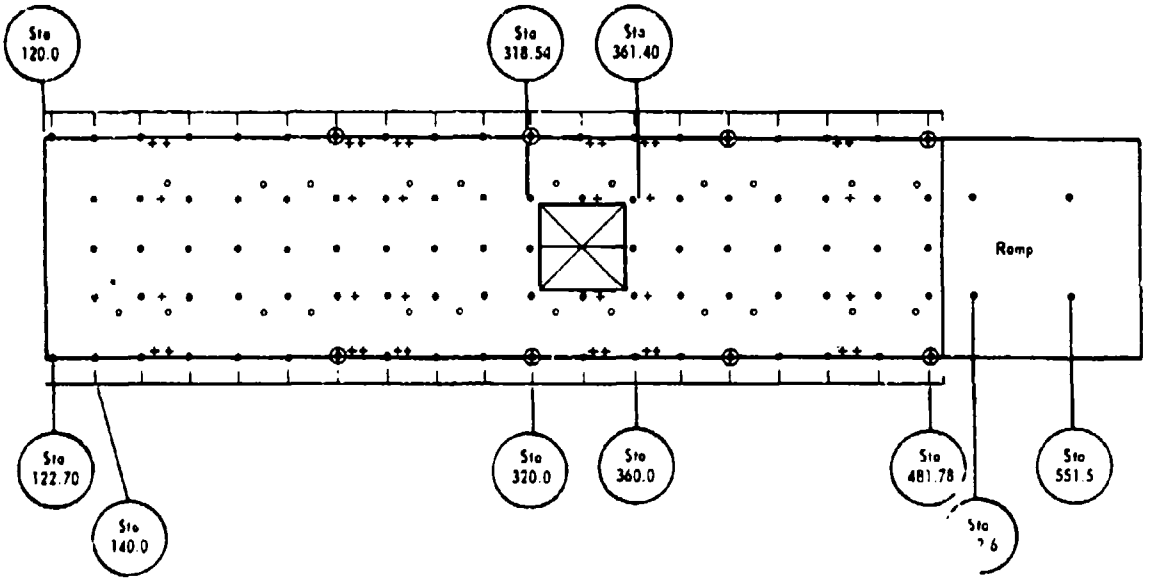
(e) Should the helicopter experience engine failure in flight, the load can be released and the helicopter return on one engine where this may not be possible with an internal load

(f) The loss of secrecy is the major disadvantage - a 105mm howitzer under a CH-47A looks the same to friend and foe.

(12) All items of equipment needed for loading and securing cargo and for preparing the helicopter to carry troops or litter patients are stowed in the helicopter.

d. Preparation of Aircraft and Cargo for Loading and Unloading.

(1) Preparation of general cargo. (See TM 55-450-9.) The supported unit prepares all cargo to conform to required dimensions, ACL, contact pressure, or CG. The placement of loads in the helicopter is accomplished by the supported unit. The CE computes weight and balance for the helicopter based on information provided by the supported unit.



o Seat Fitting

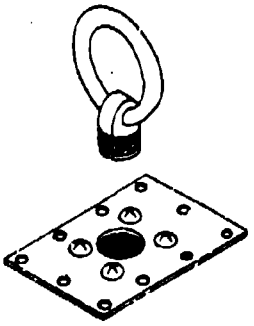
\+ Litter Fitting

• 5,000-Lb Tiedown Fitting

⊕ 10,000-Lb Tiedown Fitting

Seat Fittings

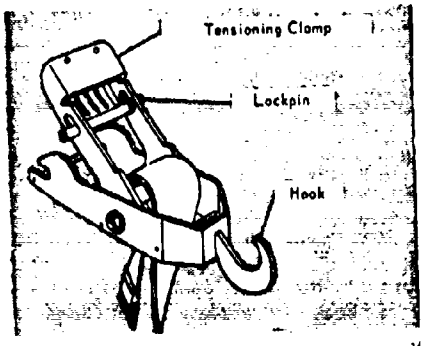
Litter Fittings



10,000-Pound Tiedown Fittings

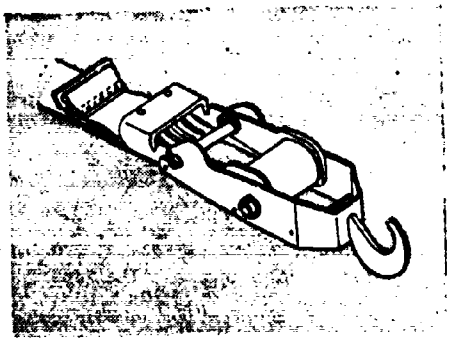
5,000-Pound Tiedown Fittings

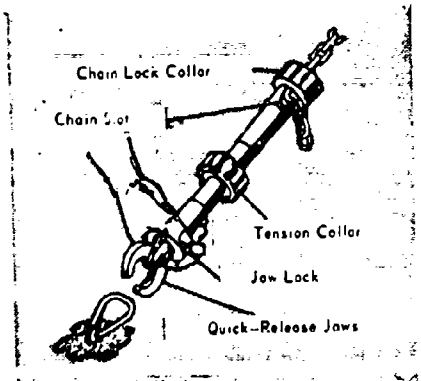
Figure II.23. Tiedown Fittings.



MC–1
Tie–Down Device

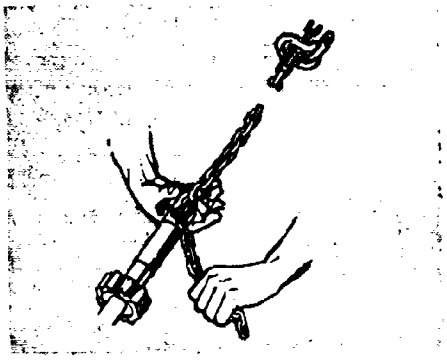
1. Hook tiedown device to tiedown fitting.
2. Move lockpin away from hook end to free tensioning clamp.
3. Pull free end of strap until device is taut.
4. Place tensioning clamp in lock position.

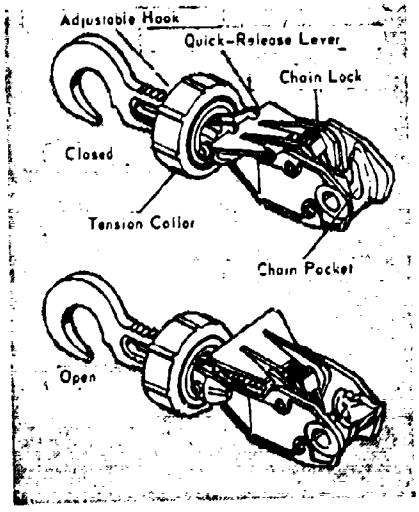




C–2
Tie–Down Device

1. Turn jaw lock to open quick–release jaws.
2. Turn jaw lock to close jaws on the tie–down fitting.
3. Turn chain locking collar to expose chain slot. Draw up chain until snug and insert in slot.
4. Turn chain locking collar to lock chain.
5. Rotate tension collar to tighten chain.





MB–1
Tie–Down Device

1. Extend adjustable hook by rotating tension grip.
2. Insert chain in chain pocket.
3. Push chain down until it bottoms and is secured by the chain lock.
4. Rotate tension collar until chain is tight.
5. To release device under load pull up on quick release lever

Figure II.24. Operation of Tiedown Devices.

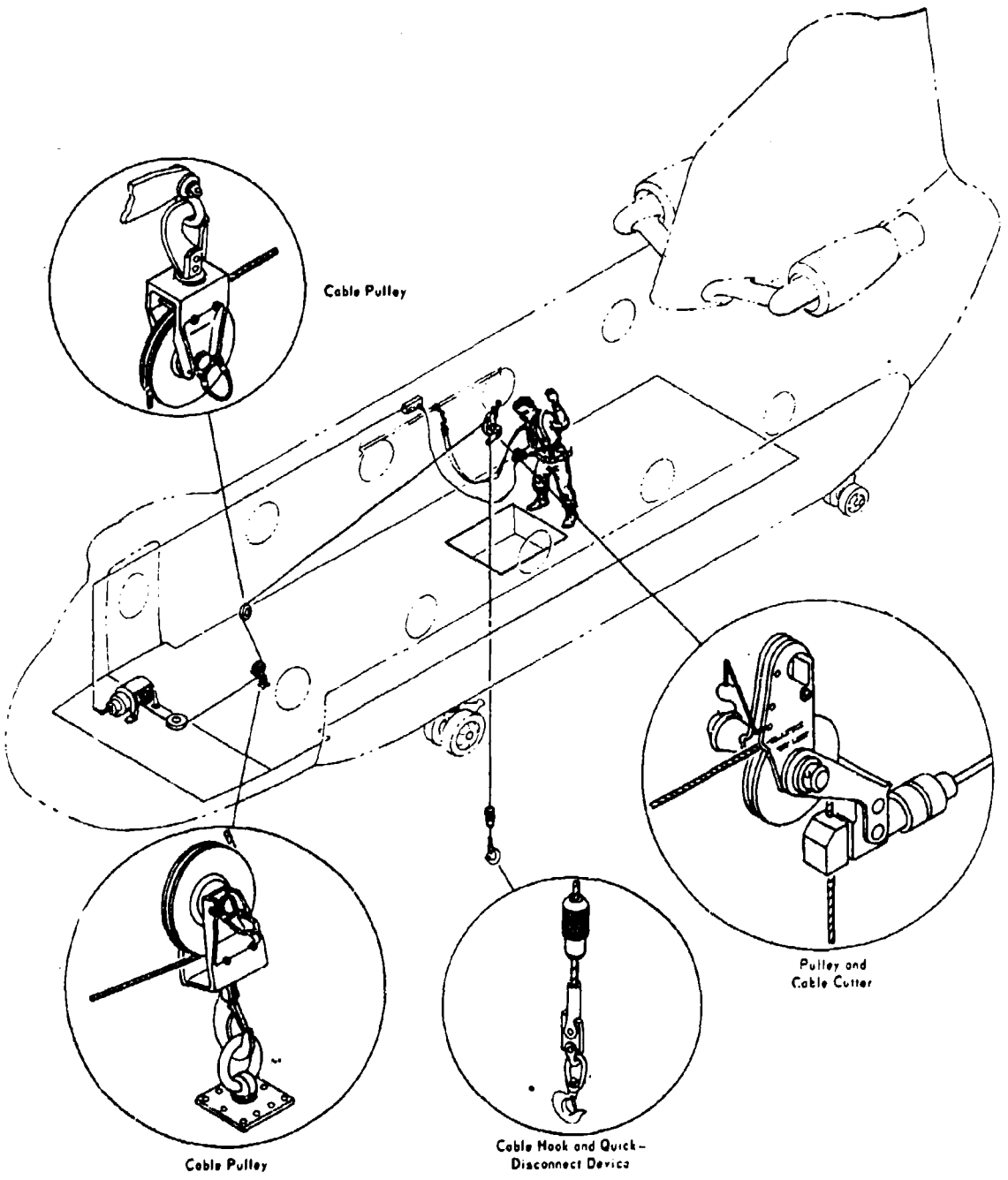


Figure II. 25. CH-47A Hoisting System.

(2) Vehicle loads. The Chinook can transport up to the 3/4 ton truck with trailer as internal loads. Some general guides to follow when transporting vehicles in the CH-47A are:

(a) Vehicle and internal vehicle cargo must be secured.

(b) Mark weight and CG on the side of the vehicle or trailer.

(c) Fuel tanks 3/4 full.

(d) Supported unit personnel load the vehicle.

(e) Mules are started only when the driver is in the seat and the clutch is disengaged - this means two men should accompany mule loads.

e. General Instructions for Loading, Securing, and Unloading Cargo.

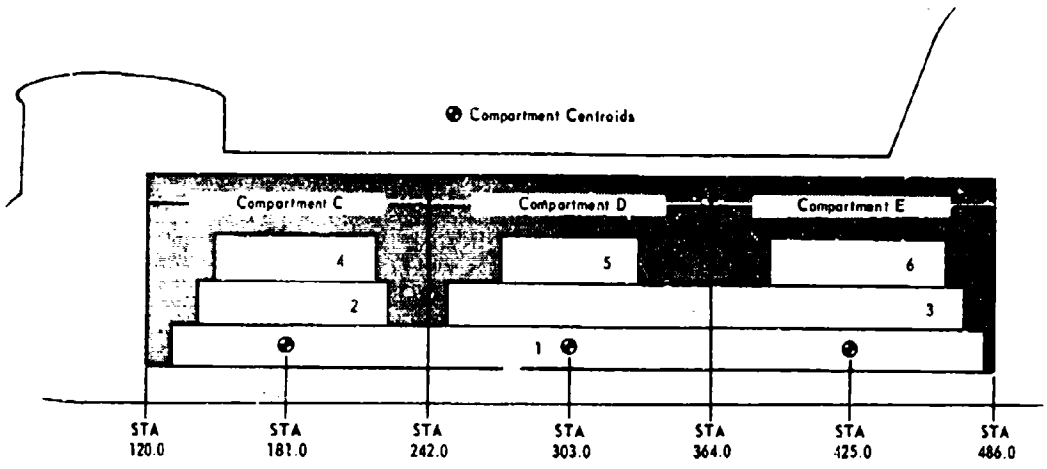
(1) Cargo loading. There are three prime factors to be considered in properly loading the CH-47A. The weight of the cargo to be loaded must remain within the ACL, the balance of the load must be within safe limits, and the cargo must be restrained. (These factors are covered in TM 57-210.)

(2) Loading planning. The first step in load planning for the CH-47A is to decide which method will be employed to compute the CG of the load. If the compartment method is to be used, each item of cargo must be assigned a location in one of the compartments. If the load consists of a number of items of cargo, the compartment method should be used. If the station method is to be used, specific station locations must be assigned to each item of cargo. The second step is to compute the CG of the load. The third step, to check the CG tables, will be accomplished by the supporting aviation unit (LNO) based on the data furnished by the supported units.

(a) Compartment loading. (Figure II.26.) Loading by compartments provides a rapid means of computing the CG of a load. Using the compartment method the CG of all the cargo in the compartment is at the centroid of the compartment. If an item of cargo extends into two or three compartments, the weight is proportionately distributed in each compartment. The CG of the cargo load is computed as follows:

1. Record the weight of the cargo in each compartment.
2. Calculate the compartment moment by multiplying the total weight in each compartment by the station number of the compartment centroid.
3. Add the compartment moments.
4. Add the weight in all compartments.
5. Divide the sums of the cargo moments by the total weight of the cargo. The result is the arm or CG location of the load.

(b) Station loading. (Figure II.27.) Loading by stations provides a more precise method of computing the CG of a load and should be used whenever possible. To use this method it is necessary to know the CG of each item of cargo. Station loading requires that the CG of each item placed in the helicopter coincide with a fuselage station number. The CG of the load is calculated as follows:



Example

Problem: There are six items of cargo to be loaded. The weight of each item was found when the cargo was prepared for loading and is as follows:

Item 1	900 Pounds
Item 2	300 Pounds
Item 3	1,000 Pounds
Item 4	200 Pounds
Item 5	700 Pounds
Item 6	400 Pounds

The loading plan is to locate items 2 and 4 in compartment C, item 5 in compartment D, and item 6 in compartment E. Item 1 and 3 are long and will be loaded so 1/3 of item 1 will be in compartments C, D, and E and 1/2 of item 3 will be in compartments D and E. Compute the CG of the total load.

Solution: Since the load consists of several items, the compartment method is used to calculate the CG of the load. Refer to Chapter 13, paragraph 5-7, for step by step instructions.

Weight in C
300 (1/3 wt of item 1)
300 (wt of item 2)
200 (wt of item 4)
Total Wt 800 Pounds in C

Weight in D
300 (1/3 wt of item 1)
500 (1/2 wt of item 3)
700 (wt of item 5)
Total Wt 1,500 Pounds in D

Weight in E
300 (1/3 wt of item 1)
500 (1/2 wt of item 3)
400 (wt of item 6)
Total Wt 1,200 Pound in E

Total Weight in Helicopter

800 in compartment C
1,500 in compartment D
1,200 in compartment E
3,500 Total

Total Moment = (Total wt in compartment C) 181 + (Total wt in compartment D) 303 + (Total wt in compartment E) 425 = (800 X 181) + (1,500 X 303) + (1,200 X 425) = 1,109,300

$$CG = \frac{\text{Total Moment}}{\text{Total Weight}} = \frac{1,109,300}{3,500} = 314 \text{ (Station)}$$

Now that the center of gravity of the total load has been computed, compute the helicopter center of gravity.

Figure II-26. Compartment Loading.

1. Record the weight and station number of each item of cargo.

2. Calculate the moment of each item by multiplying the weight of the item by the station number of its CG.

3. Add the moments of each item to obtain the total load moment.

4. Add the weights of each item to obtain the total load weight.

5. Divide the total load moment by the total load weight to obtain the arm or the CG location of the load.

(3) Securing cargo.

(a) See Restraint, TM 57-210.

(b) The amount of restraint required to keep the cargo from moving in any direction is called the restraint criterion and is expressed in units of the force of gravity, or g's. The following restraint factors are ultimate values and the minimum acceptable factors for the CH-47A:

Direction	Restraint Criteria
Forward	4.0 g's
Aft	2.0 g's
Down	4.0 g's
Up	2.0 g's
Sideways	1.5 g's

f. Armament System. The armament subsystem XM24 consists of two 7.62mm machineguns used in a suppressive fire role.

g. LZ/PZ Requirements. (See Paragraph 6.17.) The standard PZ/LZ should be the size of a football field. Ninety MPH winds are created by the rotor down-wash; therefore the landing point must be kept clear of loose objects for a radius of 60 meters. The approach path to the landing point must also be clear from tents and light structures to prevent damages to the tentage and structures.

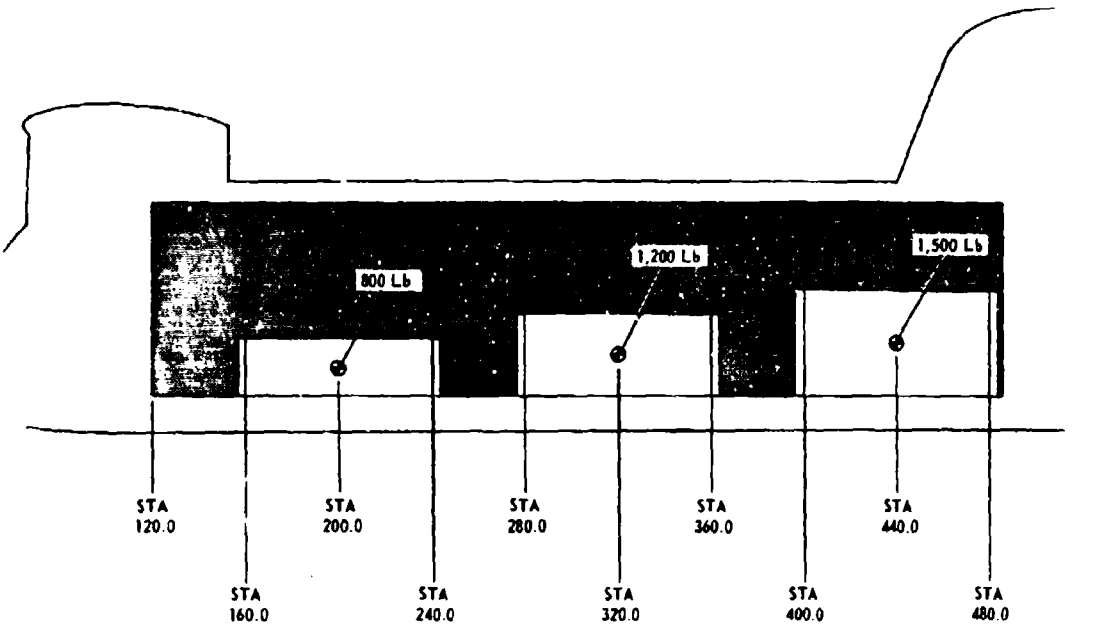
II.6 CH-54A AERIAL CRANE AND AH-1G COBRA.

a. The CH-54A (Figure II.29) heavy lift helicopter, powered by two turbine engines, has a 10-ton payload and is equipped with a detachable cabin section ("People Pod"). The helicopter is quickly converted for lifting external loads by dropping the "people pod". The CH-54A will accept loads up to 19 feet in width between the main landing gears.

(1) The Army's only "Crane Company" is an augmentation to the 1st Cavalry Division.

(2) The Infantry commander will seldom come in contact with this helicopter due to the employment priorities assigned. The Crane is used in Vietnam in the following roles:

(a) Recovery of aircraft, Army and other services.



Example

Problem: Three items of cargo are to be loaded into the helicopter. The weight and center of gravity of each item was found when the cargo was prepared for loading and is indicated above. The loading plan is to locate these items at stations 200, 320, and 440. Compute the CG of the total load.

Solution: Since there are only three items, the station method is used to calculate the CG of the load. Refer to Chapter 13, paragraph 5 8, for step by step instructions.

	Weight X Station Number	Moment
Item 1	800 X 200	160,000
Item 2	1,200 X 320	384,000
Item 3	1,500 X 440	660,000

$$\text{CG of Load} = \frac{\text{Total Moment}}{\text{Total Weight}} \quad \frac{1,204,000}{3,500} = 344 \text{ (Station)}$$

Total Weight 3,500 Total Moment 1,204,000

Now that the center of gravity of the total load has been computed, compute the helicopter center of gravity.

Figure II. 27. Station Loading.

(b) Artillery displacement with priority to 155mm howtizers.

(c) Aerial lift of heavy vehicles up to 5 tons, and engineer equipment such as bulldozers.

(d) Lift of up to 2, 000 gallons of fuel in one sortie.

(e) The detachable pod may be used as tactical operations center (TOC) or medical clearing station surgical room.

b. The Cobra is especially configured for armed helicopter missions. (Figure II. 30.) In comparison with the UH-1B the Cobra can cruise at 50% higher speeds, carry approximately twice as much ordnance and operate in the objective area three times as long, and utilizes many components of the "540" rotor UH-1B. As a result, it will enter units equipped with the UH-1 series helicopters with a minimum retraining of aviators and mechanics and make maximum use of repair parts and support equipment already on hand.

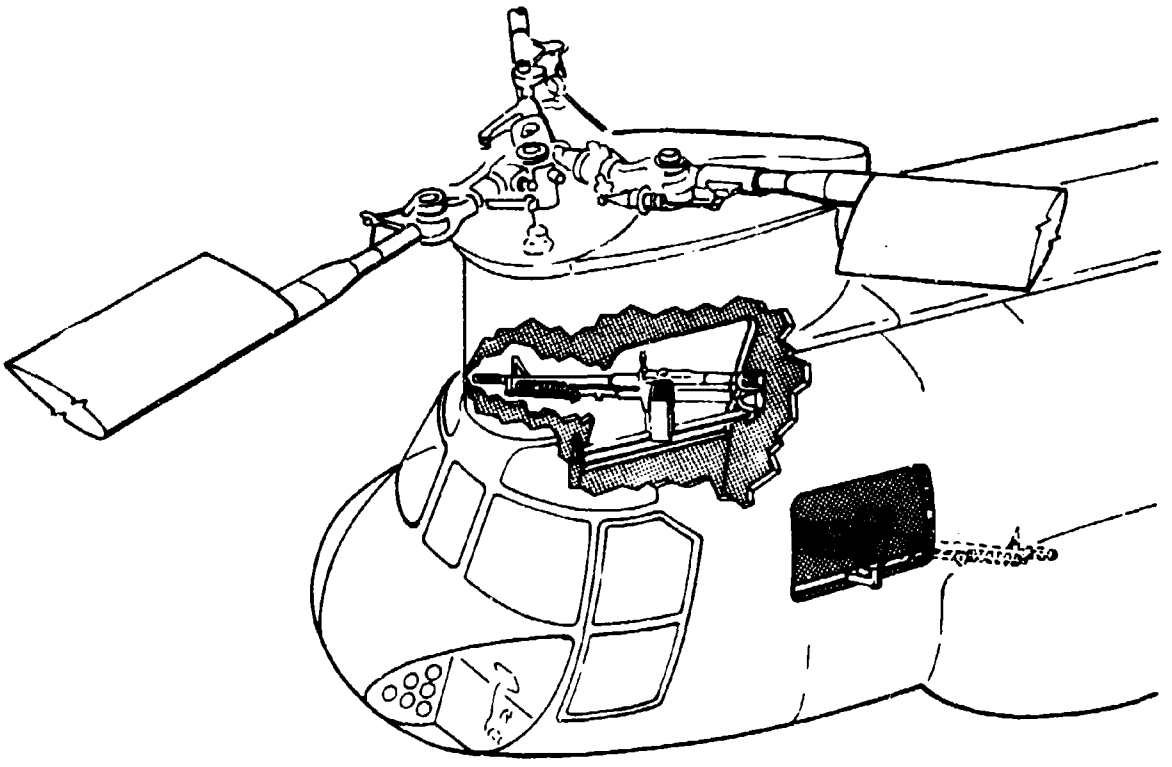


Figure II. 28. XM-24 Armament Subsystem.

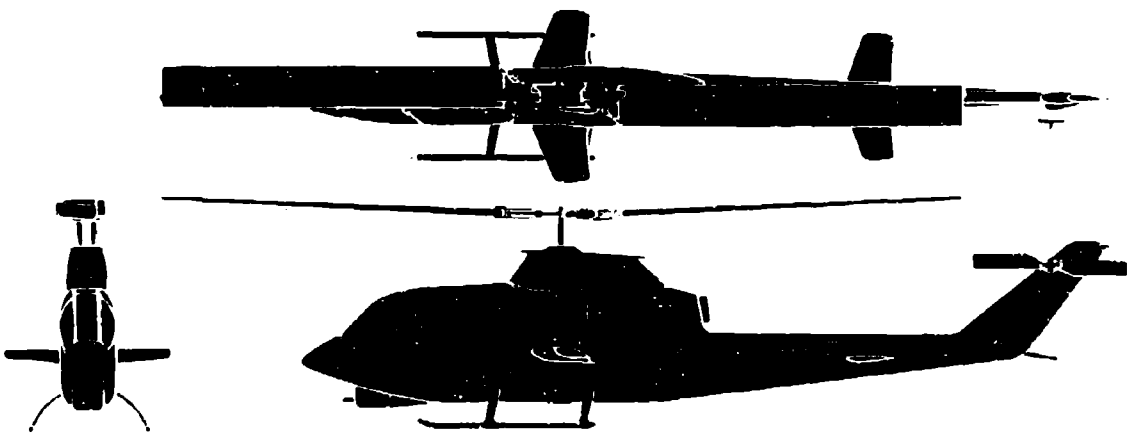
Figure II. 29. CH-54A Aerial Crane.

(1) The Cobra's tandem cockpit (Figure II. 31) arrangement provides optimum crew and weapons arrangement.

(2) The AH-1G is currently programmed for the XM28 flexible turret which mounts two 7.62mm miniguns or two 40 millimeter grenade launchers, or a combination of each. The Cobra can also accommodate the XM157, seven FFAR, or XM159, nineteen FFAR systems with a total capacity of seventy-six 2.75" FFARs. The Cobra design is suited for a wide variety of additional weapons including both 20mm and 30mm aircraft cannons.

II. 7 FIXED WING AIRCRAFT. Fixed wing aircraft are authorized only at corps and field army, except for the 1st Cavalry Division, (Airmobile) which has the OV-1B and C assigned, with an O-1F augmentation. Request channels for fixed wing support vary from command to command, therefore consult the brigade aviation officer for guidance. Aerial surveillance requests will normally follow S2/G2 channels; logistical support requirements go through S4/G4 and troop movements follow S3/G3 channels.

a. The Grumman Mohawk OV-1 is a two-place, mid-winged, tri-trail twin-engined, turboprop aircraft with a tricycle gear. The OV-1 is the Army's primary aerial surveillance aircraft, capable of carrying a variety of cameras and electronic sensors. Specifically, this aircraft is capable of being used for aerial observation, day and night photography, radar (OV-1B) and infrared surveillance (OB-1C). The ground commander can be provided with timely target information, aerial fire direction, and post-strike damage assessment by employing this aircraft in the aerial target acquisition role.



Dimensions	Height 10'2.3" Wing Span 10'11.6" Width 36" Length 44'5.2" Rotor Diameter 44' Tread Width 7'0"
Weights	Empty Weight 5288 lbs Useful Load 4212 Gross Weight 9500 lbs *Includes armor, chin turret and sighting system
Fuel Capacity	246 gallons
Performance	V_{Dive} = 190 knots V_{Cruise} = Up to 170 knots

Figure II. 30. AH-1G Cobra Dimensions.

Figure II. 31. AH-1G Cobra.

b. The O-1 Birddog is still in many units today and in Vietnam. The ground commander's only contact with this aircraft is observation of the O-1 overhead conducting its many missions, in relation to control of artillery and Air Force firepower. The O-1, manufactured by Cessna, is a two-place, tandem monoplane designed to operate from short, unimproved airfields. It is capable of carrying an external load of 250 pounds of cargo under each wing, plus 200 pounds of cargo or one observer internally at a cruising speed of 87 knots. Capabilities include battlefield illumination, wire laying, radiological survey, message drop and pickup, and radio relay.

II.8 CAPABILITIES AND LIMITATIONS OF ARMY AIRCRAFT.

a. General. All Army aircraft have capabilities and limitations that are common to each type aircraft. Therefore, rather than list each model aircraft and its capabilities or limitations, a division by rotor wing and fixed wing will serve to acquaint the student with this information.

b. Rotary Wing Aircraft. It must be noted that there is a balance between the capabilities and limitations of a helicopter. When one of three variables - fuel, range, or payload - is changed within existing weather conditions, it will change at least one of the other two variables.

(1) Capabilities.

(a) Under normal conditions, helicopters can ascend and descend at relatively steep angles, a capability which enables them to operate from confined and unimproved areas.

(b) Troops and cargo can be unloaded from a helicopter hovering above the ground with trooper ladders and rappelling means. The trooper ladder can also be used to load personnel when the helicopter cannot land. Troops may also "jump" from hovering utility helicopters up to a height of five feet.

(c) Cargo can be transported as an external load and delivered to areas inaccessible to other types of aircraft or to ground transportation.

(d) Helicopters are capable of flight in any direction.

(e) Because of a wide speed range and high maneuverability, they can fly safely and efficiently at a low altitude, using terrain and trees for cover and concealment.

(f) Their ability to fly at high or low altitudes and to decelerate rapidly, combined with their capacity for slow forward speed and nearly vertical landing, enables helicopters to operate under marginal weather conditions.

(g) Landing zones permitting, they land on the objective area in a tactical formation, negating timely reorganization of assault troops.

(h) Night landings and take-offs can be made with a minimum of light.

(i) Helicopters flying at low level are capable of effecting surprise, deceiving the enemy as to landing areas, and employing shock effect through the use of aerial fires.

(j) Under some conditions, engine and rotor noise will deceive the enemy as to the direction of approach and intended flight path.

(2) Limitations.

(a) The high fuel consumption rate of helicopters imposes limitations on range and ACL. Helicopter fuel load may be reduced to permit an increased ACL. However, partial fuel reduces the range, a factor which must be considered in planning.

(b) Weight and balance affect flight control. Loads must be properly distributed to keep the center of gravity within allowable limits.

(c) Hail, sleet, icing, heavy rains, and gusty winds (30 knots or greater) will limit or even preclude use of helicopters.

(d) On occasion, engine and rotor noise may compromise secrecy.

(e) Aviator fatigue is greater in the operation of rotary-wing aircraft than in fixed-wing aircraft.

(f) The load-carrying capability of helicopters decreases with increases of altitude, humidity, and temperature. This limitation may be compensated for through reduction of fuel load.

(g) Wind velocities above 8 knots will dictate the selection of the direction of approach and landing.

b. Fixed-Wing Aircraft.

(1) Capabilities.

(a) Tactical fixed-wing aircraft can operate from relatively short unimproved landing strips.

(b) The range is greater than helicopters and less maintenance is required.

(c) On some fixed-wing aircraft, cargo can be transported as an external load suspended from bomb shackles on the wings and can be dropped with a high degree of accuracy.

(d) Because of the high maneuverability fixed-wing aircraft can fly safely and efficiently at low altitude.

(e) Landings and take-offs at night can be made under minimum lighting conditions. (See Chapter 6.)

(2) Limitations.

(a) Require improved landing strips in comparison to helicopters.

(b) Hail, sleet, icing, heavy rains, and gusty winds (30 knots or more) will limit or even preclude operations.

(c) A wind velocity above 5 knots affects the selection of the direction of approach and landing.

(d) The load carrying capability of fixed-wing aircraft also decreases with increases in altitude, temperature and humidity.

APPENDIX III

ORGANIC AIRCRAFT RADIOS

III. 1 PURPOSE. The purpose of this appendix is to describe the communications equipment organic to the Command and Control helicopter and to explain how the equipment is used. Since either an LOH or a utility helicopter may be employed in a command and control role, both types are explained.

III. 2 Generally speaking all Army aircraft will have the same radio sets, with variations based on model, model year, and recent modification. Therefore, rather than attempt to identify any one set with an aircraft type all sets of interest to the ground commander will be discussed. If the command group will take thirty seconds for radio orientation prior to boarding the helicopter for radio orientation the material here will be recalled and assist in radio usage.

a. FM Radio Set AN/ARC-54. This is a FM set for two-way voice communications between the aircraft and ground stations, or other aircraft. The range is approximately 80 miles. It operates within the range of 30.0 to 69.9 megacycles, on one of 800 channels. The set also provides a homing capability.

(1) FM Control Unit. (Figure IV. 1. The FM control unit, marked FM/Comm* (red), is a separately housed unit containing two receiver-transmitter frequency selectors, a frequency display window, a mode switch, a volume control and a squelch control.

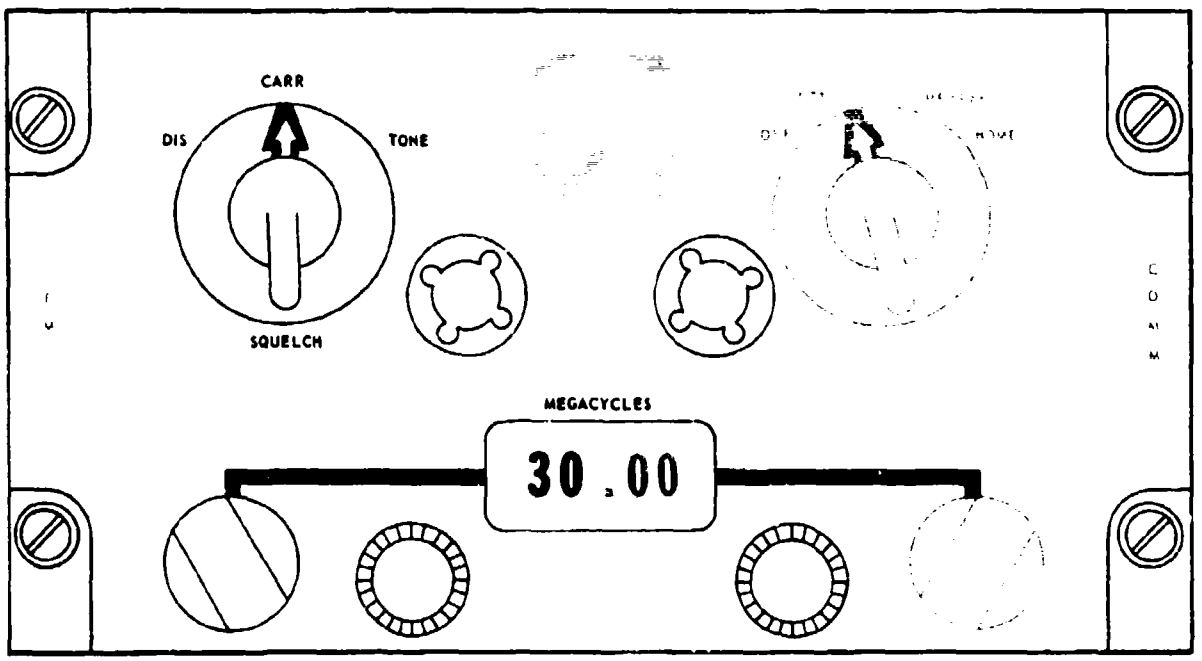


Figure III. 1. FM Control Panel C-3835/ARC-54

*Color coding is used to assist in identification and will not be found in the aircraft.

(2) The unit controls and their function are as follows:

CONTROLS	FUNCTION
Mode control (green)	The mode control (a four position rotary switch) applies power to the radio set and selects the desired mode of operation. In the OFF position power is applied to the radio set which operates in the normal communication mode. (Aircraft transmit switch must be depressed to transmit). The RETRAN (retransmit) position is not utilized. In the HOME position power is applied for operation as a homing facility.
VOL control (orange)	The volume control is used to adjust the audio output level of the radio set.
SQUELCH control (blue)	The SQUELCH control (a three-position rotary switch) is used to select the desired squelch mode. In the DIS (disable) position the squelch circuits are disabled. In the CARR (carrier) position the squelch circuits operate normally. In the TONE position the squelch opens only on selected signals.
Whole-megacycle frequency control (black)	Selects the whole-megacycle digits of the desired frequency.
Decimal-megacycle frequency control (brown)	Selects the decimal-megacycle digits of the desired frequency.

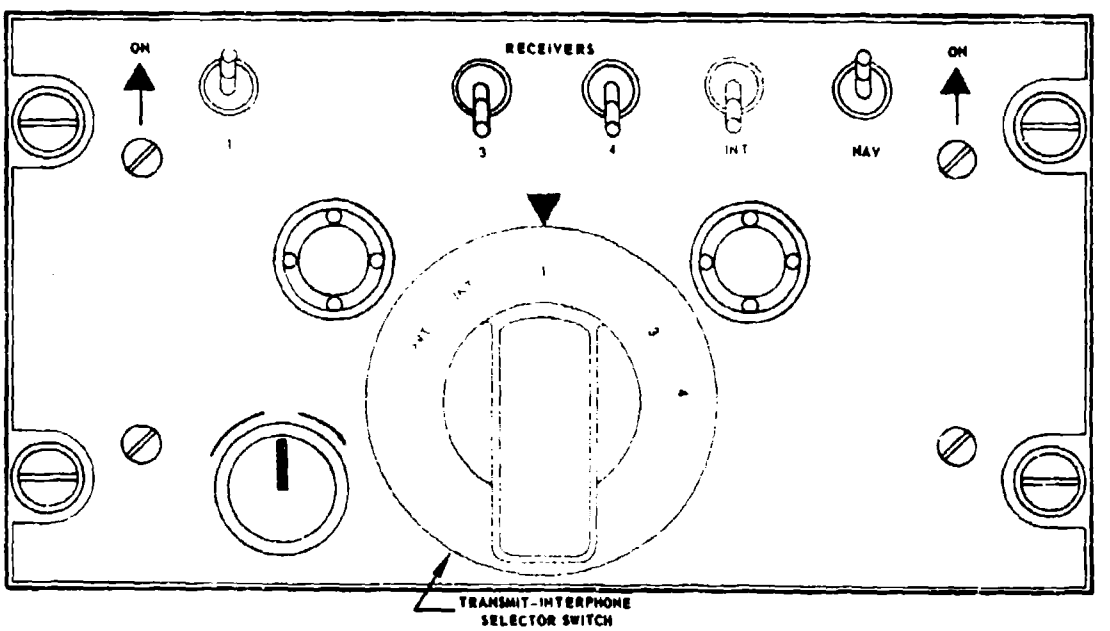


Figure III. 2. Signal Distribution Panel (C-1611A/AIC).

b. The Signal Distribution Panel (C-1161A/AIC) is part of the multi-station intercommunication and radio control system. It is used in conjunction with all radio sets to control intercommunication, two-way voice communication, air-to-air communication, air-to-ground communication, monitoring the output of the navigational receiver, and route the output of the emergency guard band receiver directly to the earphones. Two sets are mounted on the pedestal panel (Figure III. 3) for the AC and CP and one set in the overhead (Figure III. 2) cargo compartment.

(1) The intercom control marked INT (red) provides control for the selection of radio and navigation syste as well as intercommunication facility.

(2) The controls and their functions are as follows:

CONTROLS	FUNCTION
Transmit-interphone selector switch (green)	The PVT (green) position provides hot mike operation should be used only in an emergency. In the INT (green) position the headset/microphone is connected to the interphone system for voice communications. In position No. 1 (brown), the headset/microphone is connected to the FM radio set for voice communications and interphone. In position No. 2 (yellow), the headset/microphone is connected to the UHF radio set for voice communications and interphone. In position No. 3 (blue), the headset/microphone is connected to the UHF radio set for voice communications and interphone. The No. 4 (black) position is not used.
VOL control (orange)	Control the audio level of the interphone and radio receivers.
RECEIVER 1 switch (brown)	In the on position the FM radio set output is connected to the transmit-interphone selector switch.
RECEIVER 2 switch (yellow)	In the on position the UHF radio set output is connected to the transmit-interphone selector switch.
RECEIVER 3 switch (blue)	In the on position the VHF radio set output is connected to the transmit-interphone selector switch.
RECEIVER 4 switch (black)	Not used.
RECEIVER INT switch (purple)	In the on position the interphone system is connected to the transmit-interphone selector switch.
RECEIVER SWITCHES	The matching receiver switch to the transmit-interphone selector switch must be in the on position to talk.

c. Microphone Switches. Four microphone switches are installed in the aircraft: hand switches on the aviator's and co-pilot's cyclic stick, suspended in the cargo compartment, and a foot switch located on the floor at the left side of the electrical control console. All switches have a radio transmitting and interphone capability, however, the foot switch and cargo compartment switch jack can activate interphone operation only when the co-pilot's intercom control transmit-interphone selector switch is in the INT position. The foot switch is used when the co-pilot's cyclic stick is removed.

III. 3 AIR-TO-GROUND COMMUNICATIONS IN VIETNAM. The following is a description of the types of radios and radio nets used in Vietnam to establish air-to-ground communications with either Air Force aircraft and with Army helicopters.

a. All US Army ground forces in Vietnam are equipped with FM radio equipment (AN/PRC-25, AN/VRC-47), which will net with Army aircraft radios (AN/ARC-44 or AN/ARC-54). This equipment and the operator personnel are provided by TOE. Although some difficulty is experienced in communicating with the AN/ARC-44, this can be overcome to a degree by operator training. An exchange of call signs and operating frequencies is necessary to establish contact.

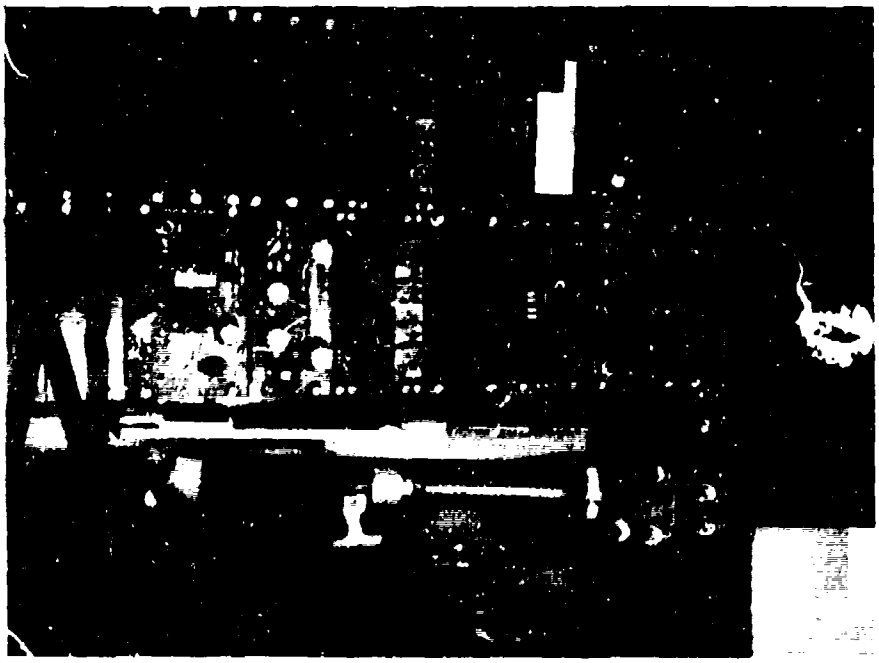


Figure III. 3. UH-1D Pedestal Panel.

b. Air Force aircraft do not normally have the FM equipment necessary to talk directly to ground forces. To fill this gap, each S3-Air at battalion and brigade is provided by TOE with an AN/VRC-24 UHF radio which has the capability to contact Air Force tactical aircraft. This is the only radio authorized the battalion or brigade with this capability. It is normally used to monitor the Air Force air-flight report net (Army Spot Report Receiver System), and is not used to transmit. However, it could be used to talk with Air Force aircraft in an emergency if call signs and frequencies are known. In addition each battalion and brigade is augmented when necessary with a Tactical Air Control Party (TACP) consisting of an Air Liaison Officer (ALO), Forward Air Controller (FAC), and two (2) enlisted assistants. The battalion TACP consists of two MRC-108 vehicles each equipped with the following equipment:

TYPE	INTENDED USE
GRC-106 UHF-AM	AF Air Request Net
AN/ARC-73 UHF-AM	Air-Ground (Control Strikes)

TYPE	INTENDED USE
PRC-47 HF-SSB-AM (Portable)	AF Air Request Net
PRC-41 UHF-AM (Portable)	Air Ground (Control Strikes)
PRC-25 VHF-FM (Portable)	Army Unit Command Net

The brigade TACP consists of only one (1) vehicle with the aforementioned equipment. Equipment and personnel are provided by the Air Force.

c. Presently in Vietnam the vast majority of tactical operations are supported not only by a ground FAC, but also by an ABN FAC (Figure III. 4). The ABN FAC has an AN/ARC-60 in an O-1 (Bird Dog) aircraft which he uses to control the air strikes. The ABN FAC also makes the post-strike analysis and transmits it over his AN/ARC-54 to the ground commander. The pilot and aircraft are provided by the Air Force. The radio equipment provided the FAC's is compatible with the UHF equipment in Army aircraft and can be used to control armed helicopters if necessary.

d. Army and Air Force aircraft are equipped with radios which will communicate with each other - if frequencies and call signs are exchanged; however, there is no designated net for this communication and both the Army and Air Force require these radios to be used in other nets. The commander in his C&C helicopter can communicate with all USAF aircraft over the helicopter UHF equipment.

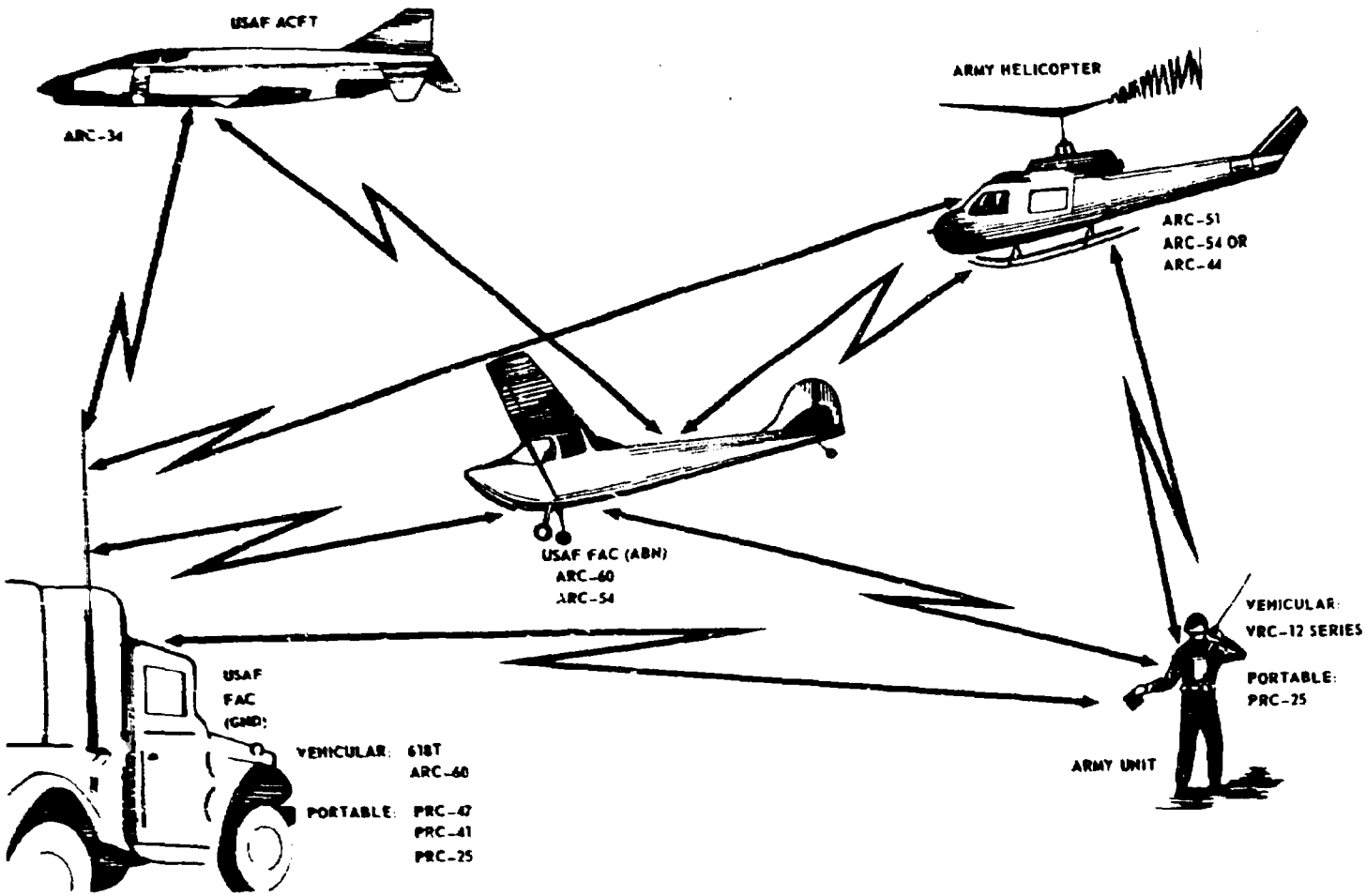


Figure III-4. Notional Air-Ground Communications Channels in Vietnam.

APPENDIX IV

TABLE IV.1. ARMY AIRCRAFT WEAPONS SUBSYSTEMS

TITLE	Weapons System Designation
XM-1	Armament Subsystem, Helicopter, Cal .30 MG; twin gun OH-13, OH-23.
*M-2	Armament Subsystem, Helicopter, 7.62mm M60C MG; twin gun OH-13, OH-23.
*M-3	Armament Subsystem, Helicopter, 2.75" Rocket Launcher, 48 tube on UH-1B, C. Will not be standardized.
XM-4	Armament Subsystem, Helicopter, 2.75" Rocket Launcher for the CH-34.
*M-5	Armament Subsystem, Helicopter, 40mm M75 Grenade Launcher nose mounted on UH-1B.
*M-6	Armament Subsystem, Helicopter, quad 7.62mm M60C MG on UH-1B, C.
XM-7	Armament Subsystem Helicopter, twin 7.62mm M60C MG for the OH-6 (Cancelled in favor of the XM-27).
XM-3	Armament Subsystem, Helicopter, 40mm M75 Grenade Launcher on the OH-6.
XM-9	SUU-7 Bomblet Dispenser on UH-1B, C.
XM-12	Armament Pod, ACFT 20mm Automatic Gun, M61 turbine driven.
XM-13	Armament Pod, ACFT 40mm Grenade Launcher (M75).
XM-14	Armament Pod, ACFT Cal .50 MG, M-3.
*M-16	Armament Subsystem, Helicopter, quad 7.62mm M60C MG; 2.75" 7 tube launcher.
XM-18	Armament Pod, 7.62mm high rate XM-134 MG.
XM-19	Armament Pod, twin 7.62mm M60C MG.
XM-20	Armament Subsystem, Helicopter, twin 7.62mm high rate XM-134 MG.
*XM-21	Armament Subsystem, Helicopter, 7.62mm high rate XM134 MG; 2.75" Rocket Launcher XM-158.
M-22	Armament Subsystem for UH-1B, C utilizing XAGM-22B.
M-23	Armament Subsystem, Helicopter, 7.62mm M60D MG; door pintle mounted on UH-1D.
XM-24	Armament Subsystem, Helicopter, 7.62mm M60D MG pintle mounted on the CH-47A.
XM-25	Armament Pod, ACFT, 20mm automatic gun, gas driven.

* Weapons Subsystems currently in use in Vietnam.

TITLE	Weapons System Designation continued
XM-26	Armament Subsystem, Helicopter, TOW Missile, for UH-1B, C, AH-1G and AAFSS.
XM-27	Armament Subsystem, Helicopter, 7.62mm high rate XM134 MG side mounted on the OH-6.
XM-28	Armament Subsystem, Helicopter, two 7.62mm XM134 MG, two 40mm M75 grenade launchers, or one XM134 and one M-75, turret mounted on the nose of the AH-1G.
XM-29	Armament Subsystem, Helicopter, one 7.62mm M60D MG pintle mounted on each side of the UH-1B, C.
XM-30	Armament Subsystem, Helicopter, 30mm automatic gun XM140 for the UH-1B, C, AH-1G and AAFSS.
XM-31	Armament Subsystem, Helicopter, 20mm M24A1 automatic gun pod mounted one per side on the UH-1B, C.
XM-32	Armament Subsystem, Helicopter, four cal. 50M2 or 7.62mm M60D MG's (2 per side) pintle mounted on the CH-47A.
XM-33	Armament Subsystem, Helicopter, cal. 50M2 or 7.62mm M60D mounted in the rear of the CH-47A.
XM-34	Armament Subsystem, Helicopter, dual 20mm M24A1 guns mounted one on each side of the CH-47A.
XM-47	Mine Dispersing System. ACFT. Two XM-3 Antipersonnel Mine Dispensers bomb shackle mounted one per side on the UH-1B, C. Disperses the XM-27 Antipersonnel Mine.

Weapons Used in Armament Subsystems

M24A1	Gun, 20mm, automatic.
*M60C	Machinegun, 7.62mm, electrically fired.
*M60D	Machinegun, 7.62mm, spade grip with thumb triggers.
*M-75	Launcher, Grenade, 40mm.
XM-129	Launcher, Grenade, 40mm (Redesign of XM-75).
XM-130	Gun, 20mm, Automatic (Redesign of M-61 to provide gas drive).
XM-133	Gun, 7.62mm High Cyclic Rate Machinegun w/gas drive.
XM-134	Gun, 7.62mm High Cyclic Rate Machinegun w/electric drive.
XM-140	Gun, 30mm, Automatic (WECOM-30).
*XM-141	Launcher, 2.75" Rocket, 7 tube reloadable, reuseable.
*XM-157	Launcher, 2.75" LSFFAR, 7 tube reloadable, reuseable, not repairable.

*XM-158 Launcher, 2.75" Rocket, 7 tube reloadable, reuseable, repairable.

*XM-159 Launcher, 2.75" LSFFAR, 19 tube reloadable, reuseable, not repairable.

HELICOPTER ARMAMENT SUBSYSTEMS

IV.1 WEAPONS SYSTEMS.

a. The M-2 Weapons Systems. (Figure IV.1.). The M-2 weapons system is designed for use on observation helicopters. It consists of two M-60C machineguns which are remotely controlled by the aviator. The combined cyclic rate of fire of the two machineguns is from 1,000 to 1,100 rounds per minute with an effective range of 750 meters. The system provides 1,100 rounds of ammunition. The weapons are fired, elevated, charged, or made fire-safe by the aviator without releasing the cyclic control.

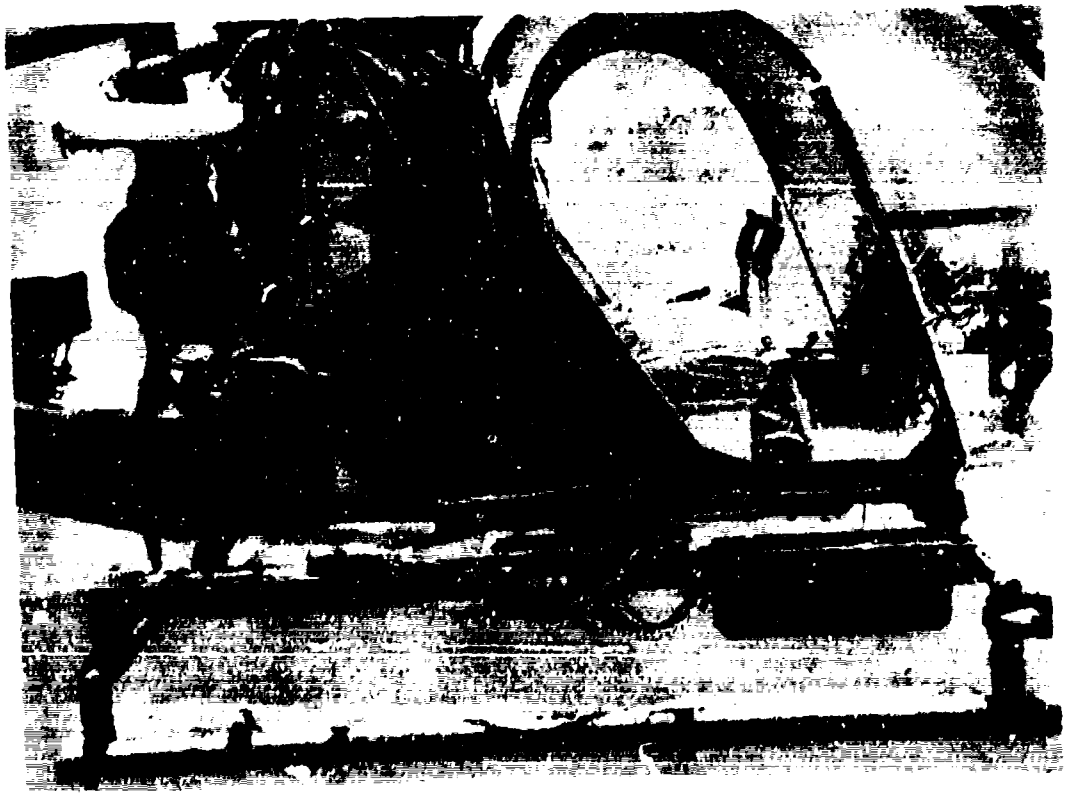


Figure IV.1. M-2 Weapons Subsystem Mounted on the OH-23.

b. The M-3 Weapon Subsystem. (Figure IV. 2.) The M-3, 2. 75-inch aerial rocket (FFAR) artillery weapons sybsystem has been adopted as the interim aerial rocket artillery (ARA) weapon. A launcher pod containing 24 rocket tubes is attached on each side of the UH-1 helicopter. These pods are jettisonable through the use of explosive bolts.

(1) The M-3 subsystem is employed as a direct fire area weapon in the air or ground role against troops, lightly armored vehicles and other point targets. The effective range of the 2. 75-inch FFAR is 2, 500 meters. The minimum fuze arming distance is 300 meters.

(2) The aviator uses the Mark 8 reflex infinity sight to align the rocket tubes with the target and fires the system with a trigger switch on the cyclic control in multiples of two up to a total single salvo of 48 FFAR's.

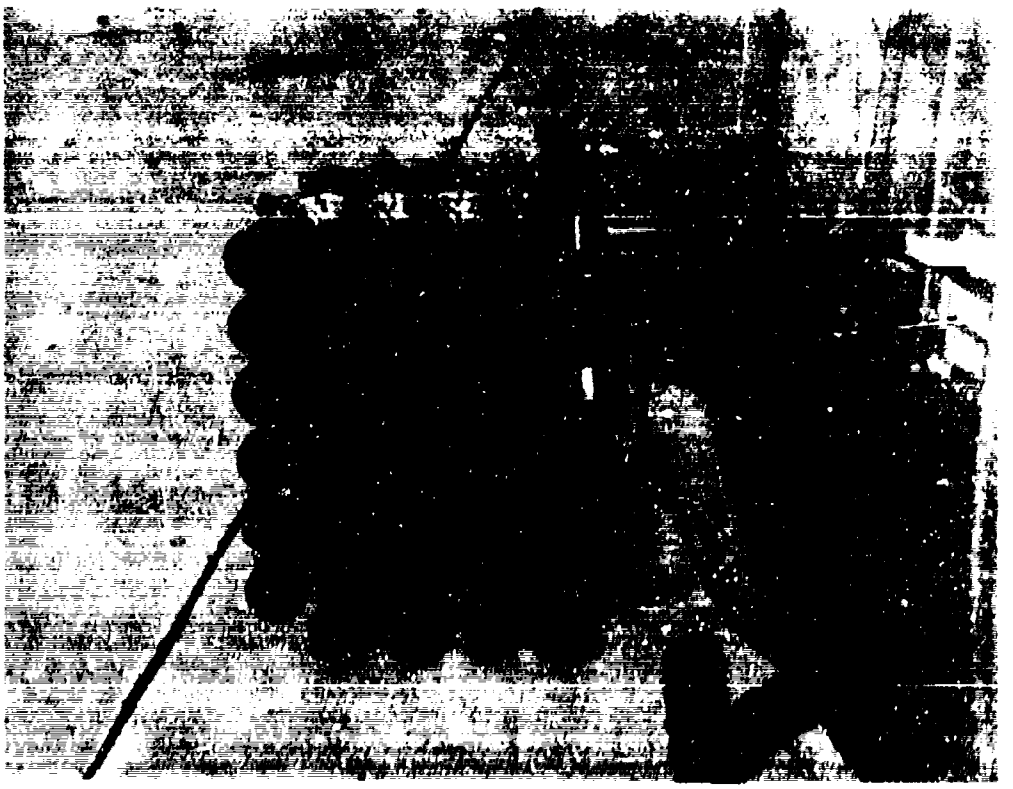


Figure IV. 2. M-3 Weapons Subsystem Mounted on the UH-1B.

c. The M-22 Weapon Subsystem. (Figure IV. 3.). The threat of armor has long been a major problem facing the commander of airborne forces. Army aviation counters this problem with the M-22 weapons subsystem.

(1) The M-22(SS-11) antitank guided missile system (ATGM) is a zero-launched, wire-guided missile system capable of providing point fire support against hard targets such as tanks, armored vehicles, pillboxes, and bridges.

(a) This system mounted on the UH-1 series helicopters consists of six missiles. Each SS-11 missile weighs 63 pounds, accelerates to a speed of 425 MPH, and is capable of defeating any known armor in existence today. The maximum range of this missile is 3,500 meters and it can be fired while the helicopter is on the ground, hovering, or in forward flight.

(b) Each missile is selected, launched, and guided by the co-pilot/gunner. The missile is guided by a small wobble stick mounted on a control box which is directly in front of the gunner. Guidance commands to the missile are transmitted by means of two wires trailing from the control mechanism to the aft-end of the missile during flight. The minimum range for effective control is dependent on the proficiency of the gunner but is normally 500 to 800 meters.

(c) For most direct fire weapons, the probability of obtaining a hit increases as the range decreases. The hit probability of the M-22 increases with an increase in range up to maximum range. This system can be fired most effectively at ranges greater than 1,000 meters. This stand-off distance keeps the aircraft out of range of most small arms fires and allows the gunner time to locate the missile in the optical sight and to aline it on the target.

d. The M-5 Weapon Subsystem. (Figure IV. 4.). The M-5 weapons subsystem consists of a 40mm grenade launcher mounted on the nose of the UH-1. It fires at a rate of 220 rounds per minute, with an effective range of 1500 meters. The killing radius of the 40mm grenade is 10 meters. The M-5 is commonly mounted with the M-3 subsystem, or the XM-157 rocket pods from the M-16 subsystem. This enables the aircraft commander to determine the exact target, engage it at long range with the 2.75" FFAR, and then let the co-pilot/gunner engage the target with the 40mm grenade launcher at closer range. Positive identification is thereby made of the target by the aircraft commander. As the aircraft nears the target and begins its break away from the target, the co-pilot can continue to place fire on the target because the 40mm gun can traverse 60° right or left and depress 35°.

e. The M-16 Weapons Subsystem. (Figure IV. 6.). The M-16 subsystem provides a mix of ordnance with which to engage a variety of targets in an aerial fire support role. The system provides two flexible gun mounts, one for each side of the helicopter. The guns may be stowed in a predetermined position, and fired as a fixed installation by either the co-pilot or aircraft commander.

(1) Each mount supports two M-60C, 7.62mm machineguns for a total of four guns with a combined rate of fire of 2,200 to 2,400 rounds per minute. Fully loaded, a total of 6,700 rounds is available. The maximum effective range is 750 meters. Adding to the firepower of the flex-mounted machineguns are two M60C machineguns manned by the crew chief and door gunner.

(2) The co-pilot/gunner may direct the fire of the M-16 independently of the helicopter attitude through the use of a sight control unit. This sighting unit remotely controls the guns which can be elevated 15°, depressed 60°, and deflected 12° inboard and 70° outboard.

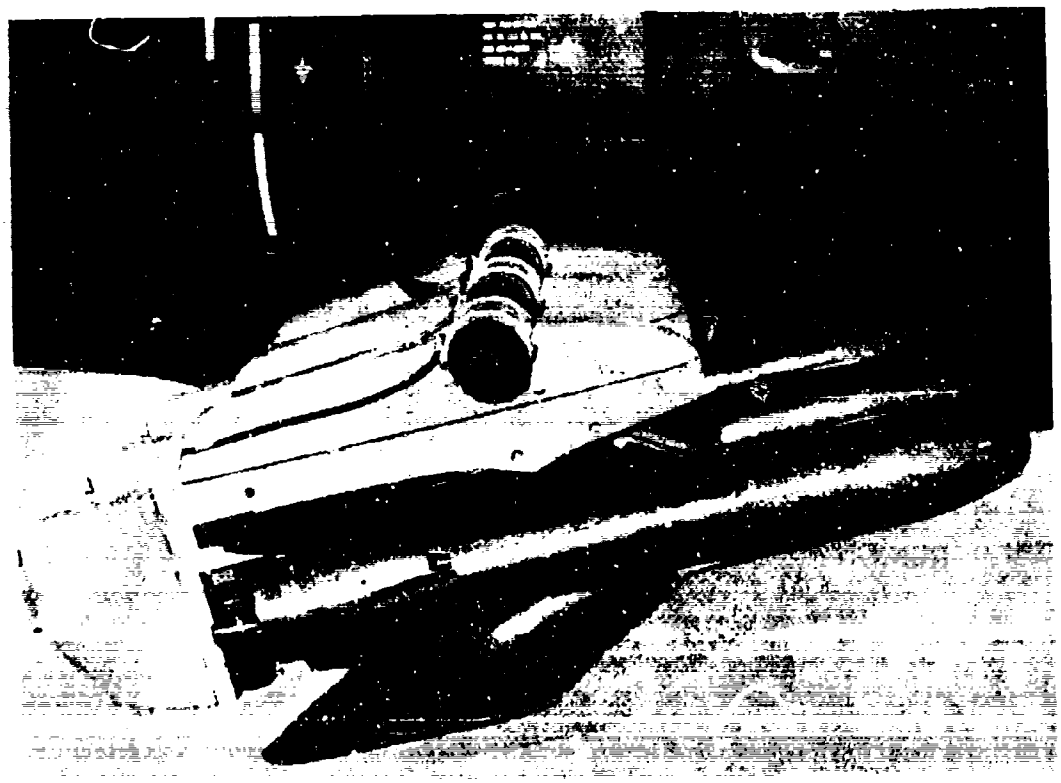


Figure IV. 3. M-22 Weapons Subsystem Mounted on the UH-1B.

Figure IV. 4. M-5 Weapon Subsystem Mounted on UH-1B.

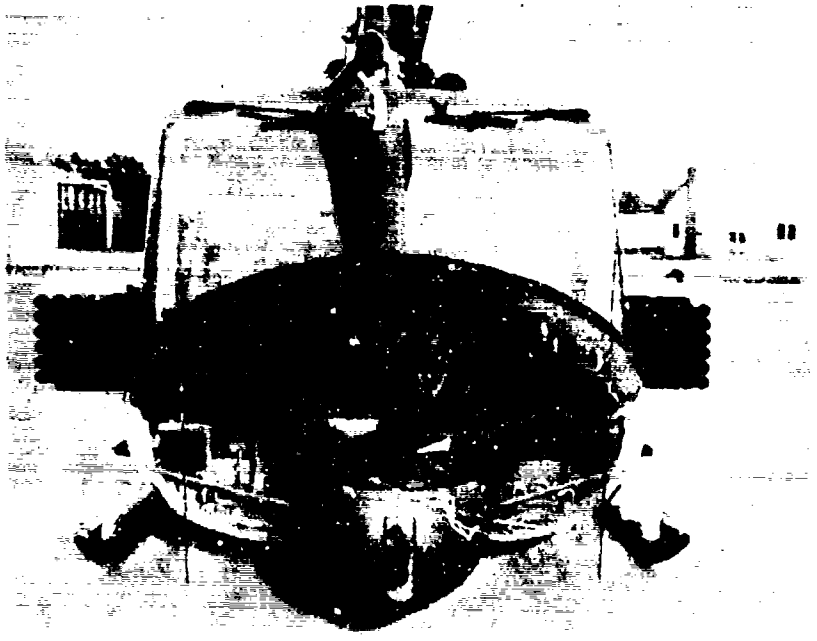


Figure IV. 5. M5/M3 Combination Weapons Subsystems on UH-1B, C.

(3) In addition to the four M-60C machineguns the system mounts two rocket pods, one on each side just below the machineguns. Each rocket pod carries seven 2.75" FFAR which are fired by the aircraft commander.

f. The XM-21 Weapon Subsystem. The XM-21 is the latest addition in armament available for support of the ground commander. The XM-21 is similar to the M-16 except that 7.62mm mini-guns have replaced the four M-60C machineguns mounted on the UH-1. The mini-gun is a scaled-down gatling gun similar to the 20mm cannon mounted on some Air Force aircraft. The XM-21 fires at a rate of 2000 rounds per gun per minute for a combined total of 4000 rounds per minute. The guns elevate, traverse, and depress just as the four M-60's on the XM-16 did. In addition, when the guns are traversed right (left) in excess of twelve degrees, the inboard gun automatically stops firing, and the outboard gun doubles its rate of fire. A new repairable reusable rocket pod (XM-158) is used with the XM-21 with each pod carrying 7 FFAR's.

g. The XM-27 Weapon Subsystem. The XM-27 is a 7.62mm highrate, highspeed, electrically fired machinegun, mounted on the left side of the OH-6A. The XM-27 fires at a rate of 2000 rounds per minute and can be elevated and depressed by the aviator flying the aircraft. This weapon will not normally be used as an aerial fire support weapon but is armed merely for its own self protection to provide defensive fires for the OH-6A during the accomplishment of its normal assigned missions, i.e., reconnaissance, etc.

h. XM-8 Weapon Subsystem. The XM-8 is one of the armament subsystems mounted on the OH-6A. The XM-8 is a 40mm grenade launcher mounted on the left side and fires at a rate of 220 shots per minute.

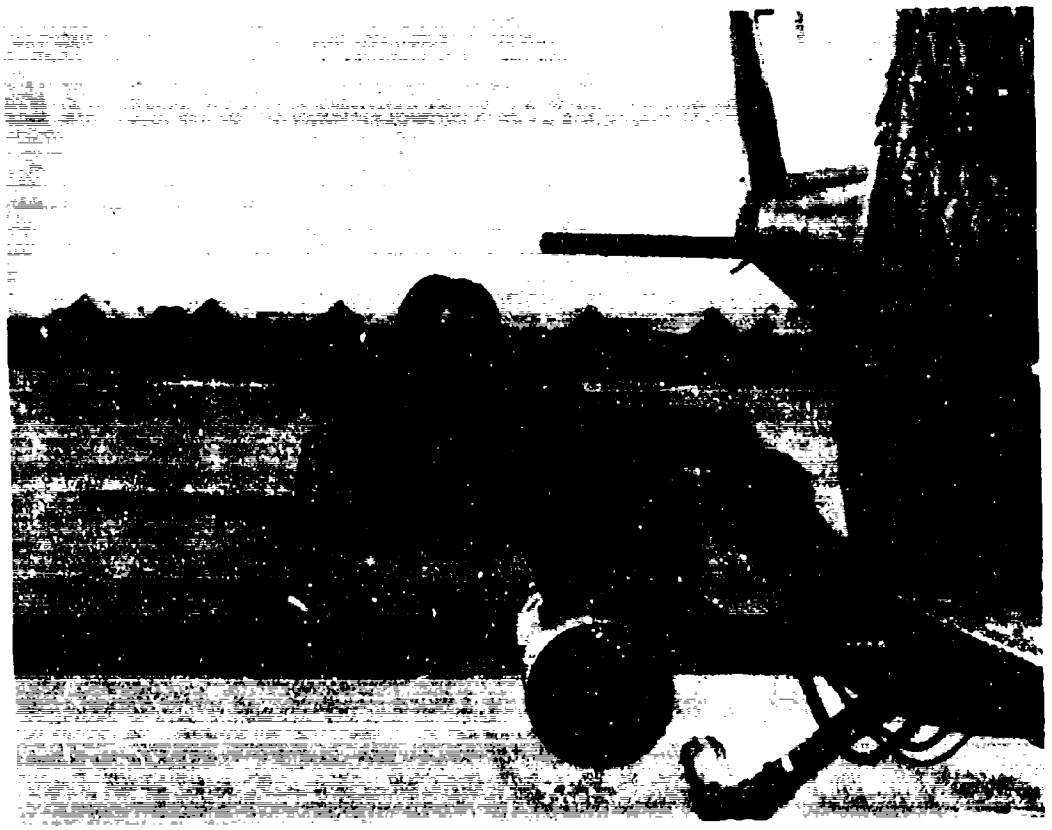


Figure IV. 6. M-16 Weapon Subsystem on UH-1B

APPENDIX V

AIRMOBILE STANDING OPERATING PROCEDURE

(CLASSIFICATION)

Copy No. _____
1-66th Infantry Battalion
21st Infantry Division
Fort Benning, Georgia
25 December 1966

Annex E (Airmobile Operations) to 1-66th Infantry Battalion, 21st Infantry Division Field Standing Operating Procedure.

1. GENERAL.

a. Purpose. This annex prescribes the organization and procedures to be followed in preparing for and executing airmobile operations. Only procedures peculiar to airmobile operations are included herein; otherwise, basic SOP applies.

b. Application. Applies to all organic and supporting units under control of 1-66th Infantry Battalion. Unit SOP's will conform.

2. PERSONNEL.

a. Strength, Records, and Reports.

(1) Units will habitually be organized into assault, followup, and rear echelons ready for immediate airmobile operations. Upon receipt of warning order submit strengths through S1 to S3 - Air, by echelons.

(2) Confirm assault echelon strengths upon closing into LZ(s) to C&C helicopter or forward CP by radio.

b. Discipline, Law, and Order.

(1) S1 will establish a straggler control point in the Loading Zone in coordination with S3 and LCGO. All units will have a representative (from rear echelon) located at this point. Personnel "bumped" from assigned aircraft report immediately to this point for rescheduling into objective area.

(2) Straggler control is unit responsibility upon landing in LZ.

(3) Personnel landed in other than assigned LZ report to unit commander (representative) immediately. Personnel are attached until ordered returned to unit by this headquarters.

(4) Gaining unit will report to C&C helicopter stragglers by name and unit immediately. (Do not include stragglers in strength reports).

c. Prisoners of War. Report immediately to C&C helicopter for evacuation instructions. Indicate available PZ for withdrawal by air in inital report.

d. Graves Registration. All deceased personnel will be reported by number only - use brevity code - for evacuation. Indicate PZ for evacuation. Burial authorized only on specific orders.

e. Medical Evacuation. Report all cases for evacuation by priority code immediately for evacuation instructions. Direct contact with aeromedical evacuation helicopter authorized for serious WIA. Make maximum use of "back haul" by utilizing transport helicopters, however, do not interrupt assault landing sequences - use last helicopters in.

3. INTELLIGENCE.

a. Current enemy situation provided upon notification of mission.

b. Weather.

(1) Long-period forecast immediately after receipt of mission.

(2) Short-period forecasts up to takeoff time.

(3) When weather is below 1/2 mile visibility and 100 feet, operations executed only on order of this headquarters.

c. Terrain.

(1) Maximum utilization of command reconnaissance down to platoon leaders consistant with aviation resources and available time.

(2) Use sand-table briefing techniques when possible in conjunction with maps and aerial photographs.

(3) Maps issued immediately after receipt of warning order.

(4) Aerial photographs available upon receipt. S2 will automatically process all requests for battalion. Priority of issue to assault echelon.

d. Counterintelligence.

(1) Maximum security of issued maps and aerial photographs will be exercised. Issued below company level on order this headquarters only.

(2) Marked maps, aerial photographs, written orders, etc., will not be carried into objective area.

(3) Conduct all planning and briefing under maximum security.

(4) S1 will announce pass policies immediately.

e. Evasion and Escape. Personnel in aircraft forced to land prior to arrival on objective will take the following action:

(1) Establish immediate security in vicinity of downed aircraft. Remain in that location, utilizing aircraft radios to contact recovery aircraft. Mark and clear a suitable landing site in the vicinity for recovery aircraft.

(2) If it is not possible due to enemy pressure, evade capture and attempt to join friendly units by infiltration. If casualties cannot be evacuated, medical supplies and medical personnel, if available, will be left with them. The decision to abandon casualties is the responsibility of the ranking individual present. Continuous attempts will be made to locate suitable sites for evacuation by aircraft.

4. OPERATIONS.

a. Planning.

(1) Except when accomplished by higher headquarters, this headquarters will prepare the following plans in coordination with the supporting aviation commander. Sequence of planning will be:

(a) Ground tactical plan and plans for subsequent operations.

(b) Landing plan.

(c) Air movement plan.

(d) Loading plan.

(2) Preparation of plans will be conducted continuously. The following will be given unit commanders as soon as determined.

(a) The size and composition of the force required to execute the mission.

(b) Allocate assault and logistical aircraft for the operation and establish troop and cargo ACL's based on recommendations of supporting aviation commander.

(c) Designate primary and alternate flight routes to and from objective areas, as well as flight corridors, altitude, speed and formations. State direction of landing.

(d) Designate loading zones to be used by participating units.

(3) Coordination between the helicopter lift unit and the Infantry unit to be lifted must be detailed and complete to insure minimum confusion and maximum efficiency. This coordination should include as a minimum:

(a) Enemy and friendly situation.

(b) Weather.

(c) Mission.

(d) Communication (primary and alternate frequency.)

(e) Type, number and ACL of aircraft.

(f) Pickup, flight and landing formation.

(g) Location and time of loading, SP, ACP's, RP and LZ.

(h) Flight route, speed, altitude.

(i) Fire support of LZ.

(j) Alternate LZ's.

(k) Abort plan.

(l) Location and call sign of second in command.

(m) Recon of LZ's if appropriate.

(n) Time check.

b. Loading Plan.

(1) Loading zone designated by this headquarters.

(2) Aviation LNO will arrive prior to the transports and report to LCGO for last minute briefing and coordination. The aviation LNO will notify the aviation commander of any changes, and control aircraft utilization.

(3) Serials organized into flights to support the ground tactical plan.

(4) Aircraft will land in specified formation. Units brief troops on the markings and location of their aircraft in the formation prior to arrival at Loading Zone.

(5) Aircraft arrive at approved loading sites at the latest possible time. Aircraft marked according to loading plan prior to arrival. Marking is the responsibility of the aviation commander.

(6) During a battalion move the battalion executive officer or designated representative will act as LGCO. Co XO's will so act during company size operations and platoon sergeants during platoon size operations. LGCO will maintain contact with supporting aviation commander on designated frequency. Each unit to be moved will have a representative present with the LGCO with radio contact to their unit on company frequency. These personnel will contact the LGCO 15 minutes prior to arrival of aircraft. Units must be prepared to alter loads based on change of aircraft availability and ACL's. Within each company, platoon and squad, a priority of loading must be made. Priority of personnel on each aircraft to be "bumped" will be designated. Personnel "bumped" report to straggler control point.

(7) Support aviation unit assist in the planning for the execution of loading by providing technical advice and supervision.

(8) Aircraft commander supervises aircraft loading.

(9) Cargo or equipment to be transported externaliy, secured in cargo nets or on pallet for sling loading by helicopters. Attachment of these loads to the aircraft accomplished by personnel of LCG. Unit code panels on each load.

(10) When loading personnel or cargo into an aircraft, the troop commander insures that:

(a) All of the safety measures prescribed for movement in and about the particular type aircraft are observed.

(b) All personnel approach the helicopter in the prescribed manner.

(c) No persons will go near the tail rotor.

(d) All personnel and equipment will stay below the arc of the main rotor. Personnel should be especially watchful when loading on the slope of a hill.

(e) In loading fixed wing aircraft, personnel approach from the rear.

(11) After all equipment and personnel have been loaded, the troop commander determines that:

(a) The equipment and cargo are in their proper places.

(b) The cargo or equipment required to be lashed is properly secured.

(c) Each man is seated and has his safety belt fastened.

(12) Briefing on emergencies is conducted by aviation unit representative prior to loading.

(13) When the troop commander has checked to insure that all cargo and personnel are secured, he will notify the aviator.

(14) During flight the aviator commands the aircraft. Troop commander insures that:

(a) Cargo lashings (if applicable) are checked frequently to determine that cargo is properly secured.

(b) Troops keep safety belts secured and do not smoke unless authorized.

(c) Troops stay seated and do not move around in the cargo compartment without proper authorization.

(15) Preparation of Individual. Prior to any airmobile operation, the following individual preparation will be accomplished.

(a) Fasten chin straps.

(b) Collapse bipods on M-60's and M-16's.

(c) Tie down loose equipment.

(d) Put all weapons on "SAFE".

(e) Wear gloves (desirable, but not mandatory).

(f) Unfix bayonets.

(g) Wear identification tags.

(h) Manifest - furnish an accurate list name, grade, and unit to Bn S1, through LGCO.

(16) Execution. The following sequence should be followed during the loading phase:

(a) Secure loading area.

(b) Approach aircraft only after landing is complete.

(c) Do not load until station time.

(d) Load at double time, AR man covering.

(e) Weapons will be placed between the legs, muzzle up.

(f) Troop commanders establish and maintain communication with next higher headquarters upon loading and while in flight for changes in mission, LZ's or last minute intelligence dissemination.

(17) In the event more than one lift is required, the XO will remain with the LGCO until the last lift to insure control and continuous communications.

(18) General Aircraft Load Planning.

(a) All units will formulate load plans to facilitate movement by Army aircraft on short notice assault and extraction missions.

(b) Necessary equipment for aircraft loading, and movement will be maintained on hand.

(c) Organizing and training personnel in loading of equipment to include sling loading and departure and arrival control will be responsibility of staff section chiefs and company commanders.

(d) Bn S3-Air will maintain air loading tables for Air Force.

(e) Vehicles and equipment will be prepared at all times to facilitate airmobile operations to max extent, e.g., CG marked on vehicles, hooks on M274 carriers, unit, weight and "chalk number" predetermined for vehicles and trailers.

(f) A-22 Containers: Max ht 40", max wt, 1000 lbs for all helicopter operations. This will allow lift by UH-1D helicopter and if CH-47A's are available two A-22's can be rigged together for Chinook loads.

c. Air Movement Phase.

(1) Takeoff time, passing check points, and LZ time reported to C&C helicopter by aviation aerial commander. Inability to comply with specified control times will also be reported by aerial commanders.

(2) Troop leaders remain oriented by continuous map/terrain comparisons. In case of a downed helicopter, the senior man must know where he is.

d. Landing Phase.

(1) The aviator will notify the troop commander when the aircraft is over the RP to the landing zone. The troop commander then alerts members of the unit to be prepared to unload.

(2) No movement is made in the cargo compartment until clearance has been obtained from the aviator. After the aviator (crew chief) gives the clearance signal the troops and equipment unload as rapidly as possible.

(3) After all troops and cargo have been unloaded from the aircraft, the crew chief will signal the aviator that the cargo compartment is empty. Personnel will not depart UH-1 helicopters by going around the rear of the aircraft.

(4) The troop commander insures that members of his unit clear the landing site in a safe, expeditious manner to prevent exposing personnel to unnecessary danger and to prevent any delay in takeoff and landing of subsequent aircraft.

(5) Individual weapons will be fired only on order upon offloading unless enemy contact is made.

(6) Actions when enemy contact <u>is not made</u>:

(a) Move by planeload to nearest covered and concealed position in direction of assembly area.

(b) Secure LZ for succeeding lifts (if applicable.)

(c) Organize and account for all personnel.

(d) Report.

(7) Action when enemy contact <u>is made</u>:

(a) Return fire immediately upon offloading with all available firepower to gain fire superiority.

(b) Fight by aircraft loads until platoon/company can be formed.

(c) Execute battle drill to overcome resistance.

(d) Establish LZ security for succeeding lifts (if applicable).

(e) Report.

(8) Keep the commander informed during all actions.

5. SUBSEQUENT OPERATIONS.

a. Withdrawal by air. Withdrawal by air from an operational area requires thorough planning, close coordination, and controlled execution. The following are considered minimum for any airmobile extractions:

(1) Plan defensive concentrations around the PZ.

(2) Maintain all around security until the 1st helicopter is on the ground (never assemble too early).

(3) Plan the loads so that a force capable of defending itself constitutes the last lift (never leave less than four UH-1D loads by themselves).

(4) Armed helicopters or scout helicopter teams will be in support during execution with direct communication with the commander on the ground.

(5) Unit leaders down to platoon level will draw up detailed plans for airmobile extraction from objective area. Primary and alternate PZ's, flight routes, etc., all must be planned.

(6) For extractions plan for two spare helicopters to go into PZ for lift out of last unit, when possible.

(7) General Planning.

(a) Companies will always plan to extract a platoon as the last element. When sufficient aircraft are not available at least 4 loads with commo (Platoon (-)) will be the last out. Spare seats must be planned for in the last lift in case a man is "bumped."

(b) A platoon leader/Sergeant or squad leader, with radio, will be the last man out of a PZ. He will report to his leader that the PZ is clear of all personnel and equipment, and notify immediately the AC of the helicopter he boards.

(c) Extraction fires will always be planned around the PZ.

(d) A covering force will protect the loading force and return fire if engaged. When last elements are ready to load, covering force will call in required extraction fires and use their own fire to cover their loading.

b. Displacement of Command Post.

(1) Quartering Party:

(a) Composed of S1 or Headquarters Commandant, Commo Officer or representative, and necessary assisting personnel, guides, security, and commo personnel.

(b) Quartering party selects exact location and lays out CP.

(2) C&C helicopter assumes functions of main CP during movement.

(3) Advance Party Duties:

(a) Laying out new CP.

(b) Notify main CP when new CP is set up and ready to assume duties.

(c) Insure timely and orderly arrival and displacement of main CP elements.

(d) Opening of new CP. Assistant S3 notifies CO or S3 when CP has closed and is operational in the new location.

(e) Control Responsibilities. C&C helicopter controls and directs subordinate elements during active operations. Main CP responsible for the dissemination of information and reports to higher and adjacent headquarters.

c. Security of Aircraft in Unit Areas.

(1) Passive Measures:

(a) Laager Areas (Occupancy 1-36 hours):

1. Proper selection of terrain for laager areas where access by enemy ground troops is difficult (i.e. laager areas surrounded by water, swamps, etc).

2. Proper siting of aircraft to blend with terrain and vegetation (i.e. locating parking areas in shadows, near trees, etc).

3. Parking of aircraft in laager areas so that armed helicpters can provide counter-ground fire along avenues of approach. Takeoff of aircraft is the responsibility of the aviation unit when under attack.

4. Utilizing troops in or near the laager areas to provide perimeter security. Aviation unit will augment security.

(b) Semi-permanent facilities (occupancy one to several weeks).

1. Use of camouflage nets and native materials to provide concealment from observation.

2. Perimeter troop security around airfields and heliports.

3. Initial construction of individual bunkers and progressive construction as permits.

(2) Security of supporting aviation is the responsibility of the unit commander in whose area they are laagered.

6. LOGISTICS.

a. Supply.

(1) Accompanying supplies - all classes. Prescribed load established by this headquarters for each airmobile operation.

(a) Class I. Each person will carry one "C" meal to be eaten on order.

(b) Class II & IV. Units take in one day supply of combat essential expendables.

(c) Class III.

1. Vehicle fuel tank, 3/4 full, gas cans full to the weld.

2. Units take in one day supply of oils and lubricants when vehicles accompany.

(d) Class V.

1. Units maintain basic load at all times.

2. ASR & priority of delivery specified in operations order.

(e) Repair Parts. Units take in combat essential PLL.

(f) Water. Individuals carry 2 full canteens and one bottle of purification tablets.

(2) All classes of supply delivered by Army aircraft using unit distribution of resupply.

(3) Supplies will be palletized to maximum extent by Bn S4. See Appendix 1 for type palletized loads by request number.

b. Salvage.

(1) Expedite recovery of aerial delivery containers, parachutes, cargo nets, and pallets. Commanders insure against damage or destruction.

(2) Units in objective area establish salvage collecting points when appropriate and practicable.

(3) Salvage reported to this headquarters for disposition instructions.

c. Captured material. Captured material may be used on approval this headquarters.

d. Medical Serivce Support.

(1) Aeromedical evacuation of patients until link up or extraction.

(2) Medical resupply and aeromedical evacuation of patients as prescribed for other operations.

(3) Aid station located in Bn base.

(4) Units report captured medical supplies to Bn Surgeon.

(5) Requests for evacuation to Bn Surgeon or Bn S1.

(6) POW casualties evacuated thru normal channels.

(7) Hospital locations announced for each operation.

e. Transportation and Troop Movement.

(1) Motor:

(a) Allocation of accompanying organic transport by this headquarters.

(b) Maximum use of captured vehicles to meet motor transportation requirements.

(2) Aircraft: Allocation of supporting transport aircraft by this headquarters.

f. Service:

(1) When required, technical service teams will be provided participating units on request.

(2) On linkup, nearest supporting units provide necessary service.

RIGGS
LTC

Distribution: A

OFFICIAL

BLISS
S3

TAB 1 TO APPENDIX V

AIRMOBILE PLANNING AND OPERATIONS CHECKLISTS

Appendix 1 (AIRMOBILE FORCE COMMANDER CHECKLIST To Annex E (AIRMOBILE OPERATIONS) to 1-66th Infantry Battalion, 21st Infantry Division Field Standing Operating Procedure.

1. Ground Tactical Plan:

    a. Mission(s)
    b. Objective(s)
    c. Alternate objective(s)
    d. Distance to objective(s)
    e. D-day and H-hour
    f. Special tasks
    g. Means available

        (1) Organic troops
        (2) Helicopter resources
        (3) Air Cav
        (4) Engr
        (5) Signal
        (6) Aerial radio relay
        (7) Medical

    h. Fire support

        (1) Tactical air support
        (2) Tube arty
        (3) Armed helicopters
        (4) Naval gunfire support.

    i. Control measures
    j. Assault plan
    k. Subsequent operations
    l. Rehearsals desired

2. Intelligence Requirements:

    a. Enemy locations
    b. Order recon of objective area
    c. Aerial photos
    d. Maps
    e. Terrain study
    f. Weather forecast
    g. Map reference system
    h. Latest INTSUM
    i. SOI SSI

3. Landing Plan:

    a. LZs (to include identification procedures)

        (1) Colored smoke
        (2) Panels
        (3) Flares

b. Landing formation
c. Approach and landing direction
d. Use of armed helicopters
e. Other fire support

4. Air Movement Plan:

a. Flight Routes (primary - alternate - return)

(1) RPs - Direction and distance to LZ's
(2) Enroute formation
(3) SP ACP's - CCP's
(4) Phase lines (if used)
(5) Leg distance and times
(6) Estimated time enroute
(7) Altitudes
(8) Airspeed
(9) Orbit areas for Eagle Flights and escort aircraft if applicable
(10) Laager areas - to include men and security

b. Air Movement Table:

(1) Unit to be lifted
(2) Number and type lift helicopters
(3) Avn units
(4) Take-off times
(5) Routes
(6) Units LZ's
(7) H-hour (landing time)

c. Alternate Communications Plan

(1) FM
(2) UHF

d. Loading Plan:

(1) Loading zones (primary - alternate)
(2) Assembly areas

e. Armed Helicopter Utilization:

(1) Enroute to LZ
(2) Objective Area
(3) LZ Armed recon

5. Supporting Plans:

a. Alternate plans and procedure due to weather
b. Downed A/C procedures

(1) Crew
(2) Aircraft

c. Rally points
d. Escape and Evasion instructions
e. Eagle flights
f. Laager plans
g. Rules of engagement
h. Demonstration plans
i. Spare aircraft for maintenance emergencies
j. CBR
k. Reconnaissance (Air-Ground)
l. Straggler control
m. Reporting (enroute, take-off, touch-down, intelligence and contact)
n. Aircraft disposition after assault
o. PW plan

6. Operations Requirements:

a. Warning orders
b. LNOs (receive and dispatch)
c. Attachments and detachments
d. Briefings (time and place)
e. Preparation of OPORD

7. Logistics Requirements:

a. Class five resupply
b. Feeding plan
c. Water
d. Med evac
e. Refueling

8. Debriefing

a. Lessons learned

(1) Ground units
(2) Aviation units

b. Actions taken for correction

9. Advance planning for subsequent operation

TAB 2 TO APPENDIX V

TROOPER LADDER - SOP

Appendix 2 (Trooper Ladder - SOP) to Annex E (Airmobile Operations) to 1-66th Infantry Battalion, 21st Infantry Division Field Standing Operating Procedure.

1. The purpose of this section is to prescribe policies and procedures governing the use of the trooper ladder as adapted to the CH-47A helicopter. The policies set forth herein are applicable to all units utilizing the ladder. The need for a voluminous publication on use of the trooper ladder is not considered necessary due to its simplicity of design. However, to insure that the maximum guidance reaches each person concerned, this SOP will be followed during all applicable missions.

2. RESPONSIBILITIES:

a. Unit Commanders insure that all personnel concerned are aware of their responsibilities and duties in the use of the trooper ladder.

b. The following inspections will be conducted by the AC and troop commander prior to using the ladder, time permitting.

(1) Frayed cables.

(2) Aluminum tubes secured to cables: Check for cracks, etc.

(3) Check all snap-fasteners on both ends of ladder (three on each end) and insure that the safety pins are present and in place.

(4) Check for any sharp pieces of metal or extending wires which may cause cuts and scratches.

c. Installation of ladder: (Aviation responsibility).

(1) On rear ramp: A hand rail is normally installed on rear end of the ramp with approximately 4 inches extending out over the ramp edge, and secured to two 5,000 lb tie-down fittings at station 551.5. This is reinforced with the use of the two standard tie-down straps (MC-1) over the forward ends of the handrail. The ladder itself is fastened on to the rail with the use of three snap fasteners which are saftied to the ladder. After installation, the ladder is rolled up and placed forward of the installed handrail inside the aircraft.

(2) On the utility hatch door: The cargo hook, rail, and access door must be removed for ladder installation. The hand rail is installed facing the same direction as the rear ramp hand rail. Secure it in the same manner, using the 5,000 lb tie-down points and standard tie down straps. The ladder is rolled up and secured underneath the utility door access with the use of a standard tie down strap.

d. Mandatory briefing for participating troops.

(1) Use the legs for climbing and descending; the arms for stabilization and holding the ladder close to the body.

(2) Five to six men on ladder at one time. The aircraft crew chief and flight engineer will control rate of flow on the ladder. Unstrap, and get up from the seat only as directed.

(3) When descending, the first man on the ground will steady the ladder for the remaining troops. When ascending, the man who is designated to hold the ladder steady is the last one up the ladder. Automatic weapons should be deployed on the rear ramp to cover the extraction or assault.

(4) The aircraft will not make erratic movements intentionally. When utilizing the ladder, remain calm at all times.

(5) Upon reaching ground, move away from underneath the helicopter, and deploy as directed by troop commander.

(6) Secure weapons to the body so that both hands can be used on the ladder.

(7) Emergency procedures.

(a) If aircraft starts settling towards the ground, stay calm, remain on the ladder, and watch the ground. As the ground is reached, rapidly exit the ladder and go away from underneath the helicopter.

(b) If the aircraft comes under fire, and troops are on the ladder, they should expedite their movement. No additional personnel will go onto the ladder. The aircraft will depart the area until it can be secured again.

e. Retrieving the ladder: After depositing the troops and climb-out to altitude is underway the crew will pull in the ladder while in flight.

APPENDIX VI

ARMY AVIATION ORGANIZATIONS

VI.1 GENERAL.

a. Army aviation organizations are divided into two classifications:

(1) Divisional aviation--that aviation authorized as organic to divisional units by TOE's.

(2) Nondividional aviation--aviation that is organic to corps and field army units, or separate aviation units authorized under TD augmentations to divisions.

b. The missions, capabilities and limitations of all Army aviation units are in direct relation to the types and numbers of aircraft authorized. Throughout this section units other than divisional will be referred to as type nondividional units. The student must realize that even the divisional organizations are subject to modifications of established TOE's, especially in Vietnam, and may not exist as shown in the Infantry Reference Data, USAIS. When such cases are known to exist, attention will be directed to the known changes.

c. In the interest of eliminating duplication of effort, organizational charts, related troop and equipment lists and the stated mission, capabilities and limitations will not be reproduced in this Handbook. Therefore, to derive maximum benefit from the discussion of aviation organizations in this section it is necessary that you utilize the Infantry Reference Data, USAIS, to follow each unit as it is discussed.

VI.2 DIVISIONAL AVIATION. The Infantry and Airborne Infantry divisions are the only divisions with an organic aviation battalion. All divisions do have aviation organic to: the three brigade headquarters and headquarters companies, division support command, and the armored cavalry squadron. Minor variations in the organization of each of these units exists in order to support the type division to which it is assigned. The variations, where significant, in organic aviation to the divisions will be identified as each unit is discussed. A total of 88 helicopters of the LOH and utility types are organic to the Infantry and Airborne Infantry divisions. Fifty-seven helicopters are assigned to the Mechanized and Armored divisions. The Infantry division (airmobile) has 434 aircraft both rotor and fixed wing. The mission, capabilities, limitations and employment of aviation units are discussed in FM 1-5 Aviation Company, FM 1-15 Aviation Battalion and the appropriate TOE. The Infantry and Airborne divisions have an aviation battalion per the "G" series TOE's, but are modified to meet requirements in Vietnam.

a. Organization. Infantry Reference Data, USAIS.

b. Mission. The sole reason for the existence of any aviation unit is to provide aviation support. The divisional aviation battalion can be expected to:

(1) Infantry Reference Data, USAIS.

(2) Provide command and control, logistical and administrative support for nondivisional aviation units in support of the division.

c. Capabilities and Limitations.

(1) Capabilities:

(a) The specific capabilities listed in the Infantry Reference Data and appropriate TOE must be weighed against the organizational mix of companies. The users of Army aviation must realize that this list is not all inclusive but can be expanded by the imagination of the ground and aviation commanders.

(b) In general all aviation battalions have the broad scope capability to operate throughout the spectrum of warfare to provide a means of furthering the supported commander's combat efforts.

(2) Limitations. All aviation battalions have the same general limitations.

(a) Limited ability to adequately defend itself against ground attack while in the execution of operational missions. The TOE's of all aviation units eliminate troop overhead, to such an extent that when the unit aircraft are employed on operational missions sufficient troop strength is not available to secure the base of operations. This is particulariy significant when the area required for an aviation base is taken into consideration. The personnel not directly involved in the mission are engaged in activities necessary to insure availability of aircraft to the users. Proper security of the supporting aviation unit will place a drain on the supported unit's combat power and must be planned for by the supported commander.

(b) The requirement for large quantities of fuel is a limiting factor. This is an aviation area of responsibility; however the ground commander should be prepared to provide assistance in the form of additional security forces, especially if forward logistical refueling bases are established at the AMF stage field.

(c) Adverse weather conditions must always be considered and will generally limit aviation operations to some degree. The limitations imposed by weather can be minimized and in certain cases turned into an advantage by coordination and planning.

(d) Terrain limitations on selection of adequate LZ/PZ's are in direct relationship to the type aircraft, area of operations, and the supported commander's objective.

(e) All aircraft are subject to air pressures caused by nuclear explosions.

d. Employment.

(1) The aviation battalion is employed to allow the supported commander to gain the tactical advantage in the areas of command and control, intelligence, maneuver/mobility and firepower. This statement will gain in meaning and clarity as you continue the study of this Handbook.

(2) Command relationships must be established prior to employing the aviation unit. (See Chapter 2.)

(3) The organization of the divisional aviation battalion is such that it will seldom be employed as a unit. Elements of the battalion will be employed, to the degree established by the announced command relationship, to support divisional units on a mission basis. The headquarters and headquarters company and the general support company will normally be located at the division instrumented airfield whereas the airmobile company (light) may operate in a separate LAAGER area in close proximity to the supported unit or return to the battalion base of operations. The latter is more desirable because it allows for better maintenance, in addition to reducing the supported commander's security requirements.

(4) Tactical integrity is not a new subject to a combat arms commander who has had full impact of the meaning of tactical integrity drilled into him. All aviation organizations

are established with unit tactical integrity, so if the supported commander knows the organization of the aviation unit in support of him, he can consider aviation integrity in his planning. It is equally as important that the supported unit combat elements be placed in the right LZ's, at the desired time, maintaining unit tactical integrity. This important fact will be accomplished in a more efficient manner when the flight units conducting the missions are led by the respective flight leaders (company commander, platoon leaders, and section leaders). When the tactical integrity of the lift unit is ignored then someone less qualified will be required to lead the mission. Under isolated combat conditions this may be accepted, but it should not be common practice. Therefore, the aviation commander requires control over dispatch of all aircraft to insure that all missions are led by the best possible flight leader. The most desirable is, of course, tactical cohesiveness of an aviation company with an Infantry company, for reasons of closer coordination, effective teamwork, and more positive measures of control. If it were possible tactical integrity should begin with the transport of a rifle squad in a single helicopter. This is not possible in the present time frame. However, combining the combat elements of a rifle platoon and its normal support, with a lift platoon (8 UH-1D's) can be accomplished. Transported in sorties, a rifle company can be carried by one lift company into any desired number of LZ's.

VI. 3 AIRMOBILE COMPANY (LIGHT).

a. Organization.

(1) Airlift platoon. To bear out the austere manpower organization of this company, to man all of the platoon's assets requires 48 aviators (all assigned WO's, six section commanders, three platoon commanders, and the company commander) and all assigned crew chiefs and door gunners.

(2) Service platoon. The platoon commander and maintenance WO fly the platoon's UH-1D, which is there solely as a maintenance recovery aircraft.

(3) Armament. The helicopters are employed with one 7.62mm machinegun, door mounted on each helicopter. The "G" series TOE does not authorize any additional aerial firepower capability; however, all UH-1D's in Vietnam have two 7.62mm machinegun systems.

b. Mission. The basic mission of every airmobile company (light) is the same.

c. Capabilities and Limitations.

(1) Capabilities. Infantry Reference Data, USAIS.

(2) Limitations. The limitations of the aviation battalion are equally applicable to the airmobile company, especially in the areas of security and logistical support, which is even more critical.

d. Employment.

(1) See Chapter 6, FM 1-5.

(2) The most effective use of the airmobile company is accomplished when employed as a unit. If all aircraft are not needed then platoon or section elements can be utilized. The tactical integrity of the sections should be maintained. Careful consideration should be given before employing less than two helicopters on a combat mission. The company is normally held in general support of the division and placed under operational control of a unit for the period required to accomplish a specific mission.

VI. 4 AVIATION GENERAL SUPPORT COMPANY.

a. Organization. Infantry Reference Data, USAIS.

(1) General support platoon. This is the flying unit of the company. All aircraft are assigned to the platoon's utility support section and the tactical support section.

(a) Utility support section. This section has four OH-6A's and two UH-1D's all without armament systems.

(b) Tactical support section. Here we find six UH-1B's armed with M16 weapons subsystems, or the M5 subsystems. Six of each type systems are authorized for flexibility of weapons selection.

(2) Service platoon. This platoon performs the expected maintenance functions and establishes the division instrumented airfield. The platoon has no assigned helicopters.

b. Mission. Infantry Reference Data, USAIS.

c. Capabilities and Limitations.

(1) Capabilities. Infantry Reference Data, USAIS.

(2) Limitations. The factors discussed on the aviation battalion are magnified to the extent that the flying elements of the company are entirely dependent upon the company and battalion for support. All flying units are limited to operations within refueling range of the base of operations, or they must be attached to the supported unit for logistical servicing.

d. Employment.

(1) Utility support section.

(a) The two UH-1D's will habitually be utilized as C&C helicopters for the division commander and primary staff, but may be employed on a mission basis to support other elements of the division. (See Chapter 2.)

(b) The four OH-6A's will be employed as required to support the division staff and units without organic aviation.

(2) Tactical support section.

(a) This is the unit that gives the aviation battalion commander his responsive armed helicopter support for escort of the airmobile company.

(b) These aircraft can be used to provide aerial fire support and armed reconnaissance on a separate mission basis.

VI. 5 AIR CAVALRY TROOP. The air cavalry troop has all combat elements mounted in organic aircraft. The unit combines the characteristics of tactical three-dimensional mobility and highly destructive aerial firepower.

a. Organization. The air cavalry troop organization is generally the same Army-wide.

(1) Troop Headquarters. One utility helicopter, equipped with one 7.62mm machine-gun, is provided as a C&C helicopter for the troop commander. FM radio is the normal means of communication throughout the troop.

(2) Operations section. This section consists of the required operations personnel and communications equipment to aid the commander to exercise control over the operations of the troop, and to provide communications between the troop and supported units. The operations section is the center of activity within the troop and the successful accomplishment of missions is dependent upon planning and coordination provided by section personnel. The section will frequently accompany elements of the troop into the forward area of the combat zone. The UH-1B organic to the operations section is equipped with the M5 weapons subsystem. (The airborne division troop operations section does not have organic aircraft.)

(3) Aero scout platoon. This platoon accomplishes normal scout-type aerial reconnaissance and security missions. (The airborne division troop differs in that it has four aero scout squads (light), with a total of eight OH-6A's armed with the XM27.)

(a) Platoon headquarters. The platoon commander is responsible for the training, discipline, control, and tactical employment of his platoon and for the maintenance and efficient operation of its helicopters. The platoon headquarters has one OH-6A which is armed with the XM27 weapons subsystem.

(b) Aero scout sections (light). The team leader has the same responsibility for this team that the section commander has for his section. Each section has four OH-6A helicopters, armed with the XM27 weapons subsystem.

(c) Aero scout section (heavy). This section has four UH-1B's, armed with the M22 antitank guided missile subsytem to provide immediately responsive antitank defense.

(4) Aero rifle platoon. The five helicopters are equipped with one 7.62mm machine-gun each and are capable of transporting the entire platoon.

(5) Aero weapons section. The aero weapons section provides aerial fire support for elements of the troop or squadron. It may be employed intact or as part of platoon task organizations. The four UH-1B's assigned to the section are equipped with M5 weapons subsystems.

(6) Antitank/rocket platoon. This platoon, organic only to the airborne division consists of:

(a) The platoon headquarters with one UH-1B armed with the M16 weapon subsystem.

(b) Two air cavalry antitank squads with two UH-1B's each, armed with the M22 weapons subsystem to provide an aerial antitank capability.

(c) Two air cavalry rocket squads with two UH-1B's each with a weapons selection capability of the M16 or M5 subsystems, to give the troop its own aerial artillery firepower.

c. Capabilities and Limitations. Infantry Reference Data, USAIS, and FM 17-36.

d. Employment.

(1) Employment of the air cavalry troop is based upon effective use of its unique characteristics and capabilities, and an understanding of its limitations. The troop should be employed in close conjunction with the armored cavalry squadron's ground efforts, so that the capabilities of ground and air elements will complement each other to extend the recon and security capabilities of the squadron. FM 17-36 provides a very comprehensive discussion of air cavalry troop employment and should be consulted for a full understanding of this units utilization.

(2) The troop operates largely at nap-of-the-earth altitude. This provides a relatively high degree of protection from enemy ground and air action. Aircraft are armed with area and point fire weapons capable of the destruction and suppression of enemy forces. A high degree of air and ground mobility in the service platoon permits maintenance and supply operations in the forward area of operations.

(3) Air traffic regulation and identification of aircraft is of particular importance. Only minimum air traffic control measures can be imposed if the air cavalry troop is to accomplish its assigned mission. The use of airspace in the troop area of operations will require close coordination with friendly ground elements, air defense units, and other agencies operating within the area.

(4) Organization for combat. Organization of the air cavalry troop for combat is characterized by flexibility, and is such that small tailored teams may be formed and used according to the mission. In combat, the flexibility of the troop will permit variations in the force organization to meet changing situations. Elements of the troop may perform independent missions, or elements may be cross-attached to provide several balanced teams. The troop may be supported by air elements from other sources.

VI.6 ARTILLERY AVIATION SECTION. This section is organic to the headquarters and headquarters battery of all divisions and has the same basic functions. Corps and field army artillery units have a similar section to perform aviation missions.

a. Organization. The section contains sufficient personnel to assist the commander in supervising and controlling the section operations and to man organic helicopters.

The division artillery (Div Arty) aviation officer is also the aviation section commander. He advises the Div Arty commander on all matters pertaining to the employment of Army aviation, organic and supporting, and is responsible for the training, discipline, control, and employment of the Div Arty aviation section.

b. Mission. To provide aviation support to the Div Arty headquarters and the organic artillery battalions, within the performance characteristics of the sections nine LOH's and two UH-1B's. The section provides:

(1) Adjustment of artillery fires.

(2) Aerial vehicles for command and control, aerial observation and reconnaissance. The UH-1B's will habitually be used at Div Arty level as the commander's C&C ships.

(3) Aerial radio relay.

(4) Radiological survey.

(5) Emergency aerial resupply and battle area illumination.

(6) Augmentation to aeromedical evacuation.

c. Employment. The aircraft will be employed in tasks which the commander deems of greatest importance to the successful accomplishment of his mission. Operational missions for the section are assigned by the Div Arty aviation officer under the supervision of the Div Arty S3.

(1) To maximize the effect of the available aviation support, the Div Arty aviation officer is required to exercise close and continuous coordination with the Div Arty S2 and S3,

the artillery battalion commanders, and the Army aviation element (AAE) in the DTOC. When the section cannot provide the required aviation support the Div Arty aviation officer requests additional support through the AAE.

(2) Portions of the section may be attached, placed under the operational control of, or placed in direct support of organic artillery battalions. Combat losses may be temporarily replaced from the division aviation battalion. Trained aerial observers are the responsibility of Div Arty; therefore, the aviation section must train sufficient aerial observers in accordance with AR 95-51.

(3) Observation missions are coordinated with the Div Arty S2 and the division G2-Air. The number of aircraft required to perform observation effectively will vary with the situation. More aircraft will be required in an offensive situation than in a relatively stable defense.

(4) The section should be located close to the fire direction center for maximum utilization and control. Under combat conditions the criteria for location of the section should follow the same guide lines given for locating the Infantry brigade aviation section.

(5) During displacement, the ground elements of the section move with the headquarters and headquarters battery. Aircraft and aviators displace with supported units. Nonflyable aircraft are evacuated by the support command's Transportation Aircraft Maintenance (TAM) company.

(6) The visual airborne target locator section (augmentation) provides expanded target acquisition capability by increased speed and accuracy in the location of ground targets by aerial observers operating airborne sensory devices in two utility helicopters. These devices are electronically connected to a ground station.

VI.7 TRANSPORTATION AIRCRAFT MAINTENANCE COMPANY.

a. Organization. The organization of the transportation aircraft maintenance company, division maintenance battalion, is the same for all divisions, except airmobile.

b. Mission. Infantry Reference Data, USAIS.

c. Employment. The company, minus elements of the forward support platoon, is normally located on or near the division support command. The company's two UH-1D's are there solely for maintenance use and for movement of recovery crews to downed aircraft sites and not for use by the support command commander and staff.

(2) Recovery and evacuation of aircraft. Whenever possible, unflyable aircraft are repaired in place if only to the extent that they can be cleared for a one-time flight to more suitable repair facilities. However, the extent of required repairs, or the nature of the aircraft site may leave no alternative but to evacuate. The supported unit will have the responsibility to render assistance in the security of the downed aircraft, and to report the downed aircraft if this cannot be done through aviation channels. The report will include the following information:

(a) Location of aircraft and enemy situation.

(b) Type and identification of aircraft.

(c) Name and unit of individual making the request.

(d) Parent unit of aircraft.

(e) Description of damage.

Infantry troops must be trained to take immediate action, under control of the senior Infantryman, to secure the helicopter upon emergency landings. This is very important because it will free the aircraft crew to effect repairs or prepare the helicopter for evacuation. If this security mission conflicts with the Infantry assigned mission, the conflict must be reported and instructions issued.

VI.8 BRIGADE AVIATION SECTION.

a. Organization. The composition of divisional units, except for the airmobile division, is the same with four OH-6A's authorized.

(1) The section commander is also the brigade aviation officer. He is under the staff supervision of the brigade S3.

(2) The three rotary wing aviators are capable of limited coordination with the supported unit commanders or staff officers on aviation matters. Tactical plans for airmobile operations should be coordinated with the brigade aviation officer.

(3) The four crew chiefs perform organizational maintenance to include armament maintenance. They refuel and service organic and transient aircraft, and are trained to operate the section radios. The crew chief will accompany his aircraft to the supporting unit location, but will seldom participate on missions.

b. Mission. The mission of all brigade aviation sections is essentially the same due to the nature of the OH-6A. If the utility helicopter is authorized in lieu of the LOH, then the capabilities of the section will be expanded to allow for the performance of the utility helicopter. The brigade aviation section provides LOH aviation support to the brigade headquarters and units attached to the brigade.

c. Employment.

(1) The operational missions for the section are assigned by the brigade S3, through the section commander, based on priorities and guidance established by the brigade commander. As a matter of high priority, organic aircraft are employed primarily for command and control purposes by the brigade and attached battalion commanders and staffs. Brigade units request all Army aviation support through the brigade S3.

(2) During the conduct of tactical operations, the section operates from a base of operations in the vicinity of the brigade command post. The brigade aircraft placed under operational control of the attached elements of the brigade will operate as far forward as possible to provide maximum responsive support. The section base of operations consists of a heliport and a small maintenance area. The landing site should be located within the defensive perimeter of the brigade headquarters and headquarters company. The landing site should be in an area which protects it from enemy fire and ground observation; natural cover and concealment of dispersed parking areas, maintenance areas, etc., are desirable. Dusty landing sites should be avoided because dust will reveal the operation of the aircraft and the CP location, as well as create a hazard to safe operations. It is advantageous to consider the selection of the landing site and the command post as a joint task to select an area which is mutually satisfactory.

(3) During displacement the ground elements of the section move with the Hq & Hq company and crews on operational missions displace with supported units. Nonflyable aircraft are evacuated by the TAM company.

d. Maintenance. Every opportunity for maintenance must be exploited to avoid excessive downtime. Maintenance beyond the capability of the crew chief is performed by the TAM company. Replacement aircraft are made available within the policies established by the major commander concerned.

e. Resupply for all classes of supply, except Class II, IIIA, and IV, is accomplished through normal resupply procedures and is provided by the brigade headquarters and headquarters company. When the aviation section personnel and equipment are operating with a supported unit, this unit provides resupply to the maximum extent possible.

f. The administrative support for the aviation section is the responsibility of the brigade headquarters and headquarters company commander.

VI.9 INFANTRY DIVISION (AIRMOBILE). This division is unique because it is basically an Army aviation supported division. The 1st Cavalry Division (Airmobile) is the only unit in the free world organized under this concept. This division has developed and will continue to develop new doctrine in the field of Army aviation employment. Therefore, this fact makes it most important that the organization and capabilities of this unit be understood so that the new doctrine can be applied to all airmobile operations to the extent applicable. The division has 434 aircraft and is capable of lifting approximately one-third of its maneuver elements, complete with combat support. This increase in aircraft makes it possible to implement the Army's air mobility concept by providing aircraft as the primary means of mobility for tactical, as well as logistical, employment.

a. Airmobile Division--General.

(1) Organization, mission, assignment and capabilities. Infantry Reference Data, USAIS.

(2) Limitations. Limitations of the airmobile division are not extreme or prohibitive, but are more pronounced, in the areas noted, as compared to other Army divisions.

(a) Increased sensitivity to adverse weather conditions.

(b) Increased requirements for aviation POL and aircraft maintenance.

(c) Limited capability for sustained ground combat without extensive logistical backup.

(d) Primary dependence upon the maintenance of air lines of communications (ALOC).

(e) Requirement for air superiority provided by other services.

(3) Basic organizational concepts. Basic organizational concepts include:

(a) Substitution of helicopters in place of traditional equipment such as trucks, armored combat vehicles, and heavy ground fire support systems.

(b) Elimination of heavy equipment from the combat and combat support elements to insure the operational airmobility by organic aircraft.

(c) Formation of one brigade, along with its normal supporting elements, into an airborne brigade for execution of airborne-type missions as required. (The 1st Cavalry Division (Airmobile) has deleted this requirement from its organization.)

(4) Employment.

(a) Organic airmobility systems enable the airmobile division to respond immediately and to maneuver rapidly over large areas. Organic aircraft provide an increased ability to find, surprise, and fight the enemy; overfly obstacles; and attack strongpoints from the rear or bypass. Combat and combat support elements are moved into, and are recovered from the battlefield by assigned aircraft. The division accomplishes maneuver of its combat battalions through assigned aircraft rather than through traditional surface vehicles.

(b) Armed aerial escort, air-to-ground fire support, and resupply of combat forces of the division are provided by aerial weapons systems and transport aircraft organic to the division.

(c) Surface movement and employment of the combat elements within the battlefield, exclusive of airmobile operations, are essentialiy the same as that of Infantry division units.

(5) The following paragraphs discuss organizations which possess organic aircraft only, as this is what makes the division unique.

b. Aviation Group.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment. The details of employment are covered by the discussion of each unit of the brigade. The headquarters and headquarters company does not have organic aircraft but does provide an AAE for the division headquarters. The company also contains a pathfinder platoon with four pathfinder sections and a communications platoon. The aviation group, airmobile division, has organic, 227 aircraft.

c. General Support Aviation Company.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment.

(a) Surveillance platoon. The surveillance platoon is equipped with six OV-1 Mohawk aircraft, three OV-1B's in the aerial radar section and three OV-1C's in the aerial infrared section. They provide the aerial observation, reconnaissance, and surveillance by visual, radar, infrared, and photographic means for the division. The 1st Cavalry Division (Airmobile) is augmented with 12 O-1F's in addition to the Mohawks.

(b) Support platoon. The support platoon has 10 LOH's (OH-6A's authorized) armed with the XM27 armament subsystem. They provide aviation support to the division headquarters and other elements of the division without organic aviation requiring this type support.

(c) Utility platoon. The utility platoon is equipped with 6 UH-1B's and 4 UH-1D's. The UH-1B's are armed with the M16 weapons subsystem and the UH-1D's are equipped

with the XM23 armament subsystem. These helicopters provide support for the division headquarters and other elements of the division without organic aviation.

d. Assault Helicopter Battalion.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment. Ideally, one assault helicopter battalion will operate in direct support of one Infantry brigade, and each lift company in direct support of an Infantry battalion. However, this is not possible because the division has only two assault helicopter battalions. Therefore, the assault helicopter battalions will operate under division, with each assault helicopter battalion assigned an Infantry brigade for priority support; the third brigade will be supported by either battalion. Versatility of the battalion must be maintained to the extent that it can effectively be employed in different types of operations.

e. Aerial Weapons Company, Assault Helicopter Battalion.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment. Twelve UH-1B helicopters are organic to the company, four in each of the weapons platoons. These helicopters are armed with the M16 or M5 weapons subsystems, plus two door mounted M60C machineguns. The aerial weapons company may be employed as a unit, as separate platoons, or as sections. In support of airmobile operations, the company provides escort, planned security, and suppressive fires under the control of the lift unit commander. When placed in DS of a specific ground unit, the company provides "on call" fires and is under the control of the supported commander. In either event, fires of the aerial weapons company should be included in the fire support plan, and coordinated with the complete operation.

f. Assault Helicopter Company, Assault Helicopter Battalion.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment. The company has organic 20 UH-1D helicopters, 10 in each of the assault helicopter platoons. All aircraft are armed with the XM23 weapons system. (The assault helicopter companies in the 1st Cavalry Division (Airmobile) are organized with four assault helicopter platoons of 5 UH-1D helicopters each. This allows a section breakdown of 2 UH-1D's each and facilitates section integrity on separate missions, such as logistical support operations. The fifth UH-1D may either be down for maintenance, provide a C&C helicopter for the company commander, or is used to support a lift platoon that is below four operational UH-1D's.) The assault helicopter companies are assigned to support a specific Infantry battalion in so far as possible, but the company still functions as a part of the battalion on large operations. The assault helicopter companies have their own combat service support and are capabile of being employed for extended periods of time as a separate company, augmented with aerial fire support from the aerial weapons company. The platoons are not capable of independent missions without excessive support from the company.

g. Assault Support Helicopter Battalion.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment. The battalion is employed as the primary means of moving the artillery and combat engineers on the battlefield. It is also employed to move logistical elements of the Infantry battalions, the brigade forward command post, and augment troop movement after the initial assault into the objective area. Habitually, the assault support helicopter

battalion will operate in general support of the division. One or more of its subordinate units may be placed in direct support of a brigade. When this occurs, coordination and mission requirements will be received through the brigade staff or aviation group liaison officer. Normal employment of the assault support helicopter companies is on a "mission" basis.

h. Cavalry Squadron.

(1) The cavalry squadron, airmobile division, is a combat force with combat elements mounted in organic aircraft and in conventional surface vehicles. The unit combines the characteristics of tactical mobility and highly destructive firepower from both surface and aerial systems in the performance of aerial reconnaissance and security for the division.

(2) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(3) Employment. (See FM 17-36.) The squadron ideally is not fragmented, but is employed as a unit, with air elements and ground elements in close conjunction so that their respective capabilities are fully exploited and complementary. The 1st Cavalry Division (Airmobile) has found it necessary to depart from the desired employment of the ground and air elements in close relation due to the theater of operations. The squadron has been successfully employed by assigning an air cavalry troop to a brigade for operations in the brigade tactical area of operation (TAOR). The control of the troop is retained at squadron level, when possible, or the troop will be in DS of the brigade. In either case the troop works in close coordination with the committed brigade, to the extent that reports are often made directly to the battalions when appropriate by personal contact. The ground troop is employed in road and convoy recon and security missions, and frequently provides airmobile reaction platoons for committed aero-rifle platoons of the air cav troops which have been committed on the ground. The squadron efforts are directed by division to develop future areas for operations as well as conduct recon and security of the immediate area of operations. The squadron may conduct offensive, defensive, or delaying combat operations as required.

i. Headquarters and Headquarters Troop, Cavalry Squadron.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment.

(a) Maintenance platoon. The UH-1D's are used to move parts and maintenance crews to downed aircraft, and for support of the maintenance effort.

(b) Aviation platoon. The command aviation section's UH-1B's are used by the squadron commander and his staff for command and control.

j. Air Cavalry Troop, Cavalry Squadron.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment. (See FM 17-36).

(a) Troop headquarters. The troop headquarters UH-1B and UH-1D are used for command and control with the UH-1D augmenting the lift section when required.

(b) Scout platoon. The scout platoon is the aerial reconnaissance element of the troop. The scouts work in close coordination with the ground units in their assigned mission of recon and security.

(c) Rifle platoon. This platoon is used for ground recon of areas that cannot be satisfactorily covered from the air by the scouts. The platoon should always be on ramp alert to move immediately to support downed scouts or to rapidly develop a situation disclosed by the scouts.

(d) Weapons platoon. The platoon is employed in the fire suppression role and to conduct armed reconnaissance of areas. Recon by fire is a primary mission to develop situations uncovered by the scouts. The platoon is normally positioned to provide fire suppression (for the lift section) during assaults and extractions of the rifle platoon. Security requirements will dictate whether the weapons aircraft actually fire suppressive fire.

k. Cavalry Troop, Cavalry Squadron. The employment of this troop is similar to the divisional cavalry troops.

l. Airmobile Division Artillery.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Equipment. The new lightweight M102 (105mm) howitzer is replaced the M101 (105mm) howitzer, within the 1st Cavalry Division (Airmobile). Other equipment is correspondingly light and all elements are one hundred percent air transportable. Fifty-nine aircraft are organic to Div Arty; 20 are assigned to the aviation battery, and 39 are assigned to the field artillery battalion aerial rocket artillery (ARA).

m. Aviation Battery, Airmobile Division Artillery.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment.

(a) Direct support platoon. The sections are placed in direct support of each of the 105mm howitzer battalions, to perform tasks of aerial surveillance; target acquisition; and adjustment of artillery fires.

(b) General support platoon. The general support platoon provides general and utility type support to the Div Arty headquarters, and to units in Div Arty on a mission basis.

n. Field Artillery Battalion, Aerial Artillery. This organization differs from divisional 105mm howitzer unit in the manner it moves into battle and the light weight of its equipment. The mission and capabilities are the same, as well as the procedures for employment.

o. Aerial Artillery Battery, Field Artillery Battalion Aerial Artillery.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment. The ARA batteries may be employed as separate batteries, or as part of the battalion, to provide highly mobile aerial artillery fire support and antitank support, particularly during periods when the 105mm battalions are being displaced. A battery or an element thereof, may be placed in DS of ground elements.

p. Transportation Aircraft Maintenance and Supply Battalion. This unit is organized, equipped, and employed to provide the required aviation supply and maintenance support for all aircraft within the division.

q. Medical Battalion.

(1) Organization, mission, assignment, and capabilities. Infantry Reference Data, USAIS.

(2) Employment. All aircraft organic to the medical battalion are located in the air ambulance platoon of the headquarters and support company. The air ambulance platoon provides division-wide aeromedical evacuation; air crash rescue; in-flight treatment of patients;

and aerial delivery of whole blood, medical supplies, and medical service on an area basis. Normally, one medical company supports each brigade.

r. Aviation Platoon, Headquarters and Headquarters Company, Airmobile Division Brigade.

(1) Composition, mission, assignment, and limitations. Infantry Reference Data

(2) Employment. This platoon provides Army aviation support for the brigade headquarters and attached infantry battalions. (See paragraph VI.8.)

VI.10 NONDIVISIONAL AVIATION.

a. At corps and field army levels, Army aviation will be found organic to aviation groups, separate brigades, armored cavalry regiments, corps artillery battalions, field army support command, medical air ambulance units, aviation traffic control companies, and transportation aircraft maintenance and supply activities. The commander at division and separate brigade levels will receive a varied degree of his Army aviation support from these units. When a corps or field Army aviation unit is in support of the division, the division aviation officer will assume the planning and coordinating responsibilities, unless the specific missions requirement dictates the establishment of a command relationship with a tighter degree of control.

b. The aviation units at this level do not follow a set organization, therefore it is not feasible to attempt to list all aviation units common to corps and field army. One unit of each type will be covered briefly. These units are not listed in the Infantry Reference Data, USAIS, therefore the related organization chart is given here.

c. The basic mission of every Army aviation unit, regardless of its parent unit, is essentially the same--to augment the capability of the Army to conduct prompt and sustained combat incident to operations on land. The capabilities of each unit will vary with the assigned aircraft and the internal organizational structure. For our purposes, view each company and battalion unit in the light of the prior discussion on divisional units.

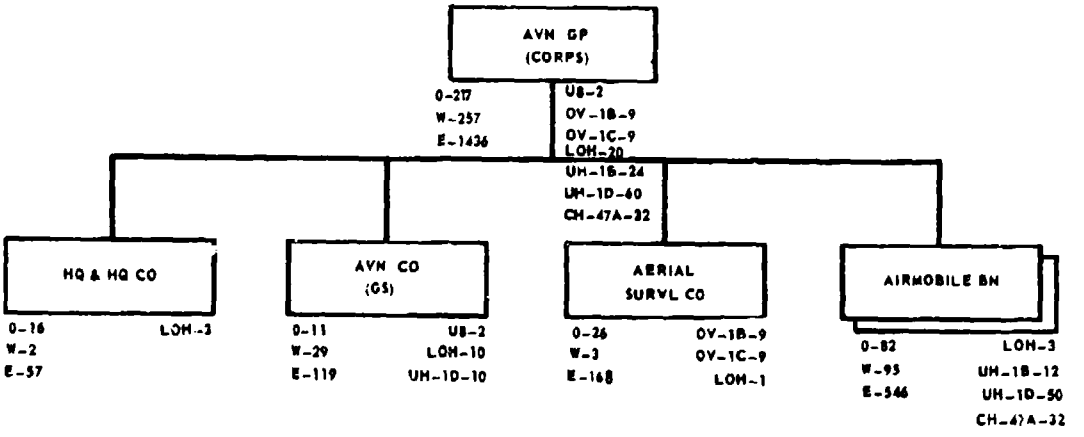


Figure VI.1. Type Aviation Group (Corps).

VI. 11 TYPE AVIATION GROUP (CORPS).

a. Organization. (Figure VI. 1.)

b. Mission. The mission of the aviation group will vary and depends upon the number of types of battalions and/or companies assigned or attached to it.

c. Capabilities. The group has the following capabilities:

(1) Supervise the activities of three to seven separate aviation battalions.

(2) Engage in coordinated defense of the unit's area.

(3) Sixty-five percent are airmobile.

d. Limitations.

(1) The group is dependent upon a corps TAM company for direct support aircraft maintenance.

(2) When operating at distances in excess of 50 miles from corps headquarters or subordinate units, augmentation is required for adequate communications.

e. Employment.

(1) The aviation group is employed as directed by the corps commander. The group headquarters is normally located in close proximity to the alternate TOC.

(2) The aviation group headquarters is staffed and equipped to be a tactical command and control headquarters. Sufficient personnel are provided to supervise the administrative and logistical functions of the subordinate units. Adequate communications and personnel are available so that the group headquarters may function as an emergency or alternate Army aviation staff section when extended frontages and multiple command posts are indicated in the tactical plan of the corps.

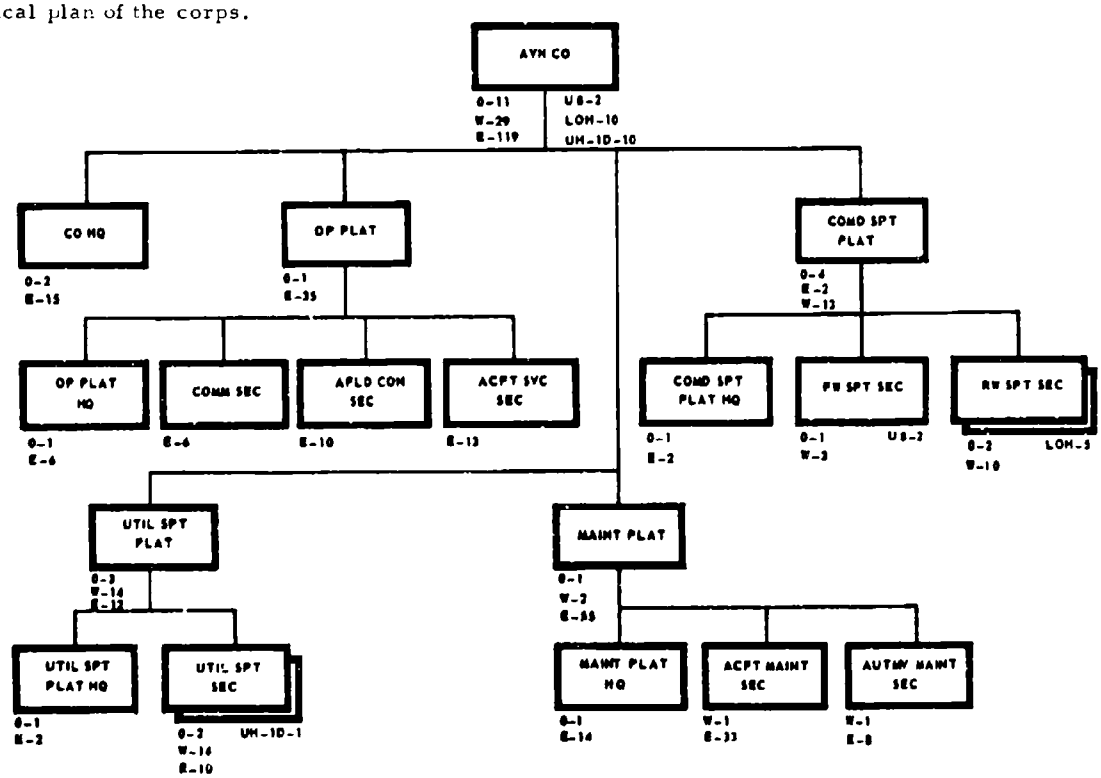


Figure VI. 2. Type Aviation Company, General Support, Aviation Group (Corps).

(3) Whenever two or more aviation battalions or separate aviation companies are assigned to the corps, the aviation group commander will normally supervise the activities of the battalions or separate companies. Consequently, the number of aviation unit headquarters dealing with the corps headquarters is reduced to one.

VI. 12 TYPE AVIATION COMPANY, GENERAL SUPPORT, AVIATION GROUP (CORPS).

a. Organization. (Figure VI. 2.)

b. Mission. The mission is to:

(1) Provide aviation support for the headquarters of the major command to which it is assigned and to other units without organic aircraft.

(2) Provide limited aviation support and reinforcement to units with organic aircraft.

(3) Operate one instrumented airfield for the headquarters of the command to which assigned.

c. Capabilities. The company is capable of providing:

(1) Continuous day and night operations during visual weather conditions. Operations under severe weather conditions are reduced.

(2) Aerial transportation for the commander and staff, including provisions for C&C helicopters and selected elements of the CTOC.

(3) Air movement of high priority personnel and emergency battlefield resupply.

(4) Aircraft for column control, courier and messenger service, radiological survey, aerial reconnaissance, and surveillance.

(5) Operation of one instrumented airfield with facilities for control of visual and instrument terminal air traffic; communications with Army air traffic control centers and air weather services; aircraft servicing for aircraft.

(6) Operation of one heliport with air-to-ground communications.

(7) Operation of one additional heliport and airfield without air traffic control.

(8) Augment aeromedical evacuation.

d. Limitations.

(1) Dependent upon the field army medical brigade, or similar unit to furnish medical service.

(2) When this unit operates more than one airfield, it is dependent upon the supporting Class IIIA supply unit for delivery.

e. Employment. Normally, the company is allocated on a basis of one per corps, and other major commands requiring general aviation support.

(1) The major headquarters may:

(a) Retain complete control of the unit.

(b) Retain only operational control and attach the company to another headquarters for administration and logistics.

(c) Assign or attach the unit to an aviation group or aviation battalion as required.

(2) The company provides air transportation with its organic command airplane and observation or utility helicopters for the members of the corps headquarters, primarily for the corps commander, his staff, and key personnel of the headquarters. Missions will usually require one or two aircraft for their accomplishment; however, the company may occasionally be employed for short periods by section or platoon. Because of the nature of the tasks which the company will perform, it will usually be employed on a mission basis rather than as a company size force.

(3) The company habitually operates from the instrumented airfield, normally located near CTOC.

g. Augmentation. This company may be augmented with two additional U-8's and additional personnel to operate and maintain them.

VI.13 AERIAL SURVEILLANCE COMPANY, AVIATION GROUP (CORPS).

a. Organization. (Figure VI-3.)

b. Mission. The company extends the surveillance and target acquisition capability of ground units through the use of organic aircraft with mounted sensory equipment and aerial observers.

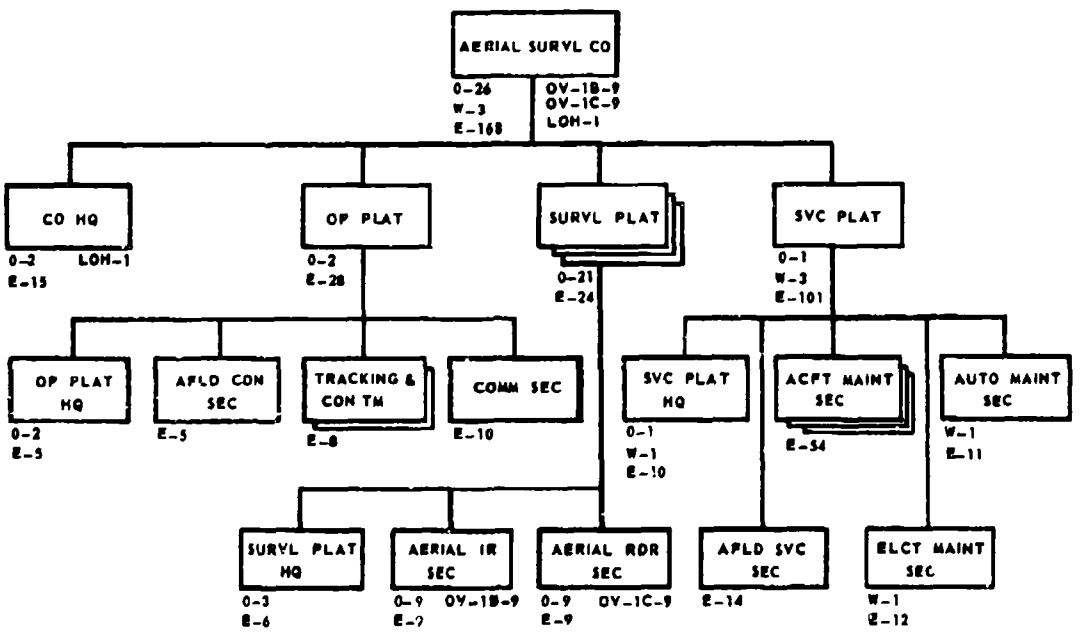


Figure VI.3. Aerial Surveillance Company, Aviation Group (Corps).

c. Capabilities. The company provides:

(1) Sustained all-weather day and night aerial surveillance.

(2) Aerial reconnaissance of routes, zones, and areas.

(3) Target acquisition.

(4) Post-strike analysis of nuclear weapons effects.

(5) CBR survey.

(6) Facilities for operation of an instrumented airfield.

d. Limitations. This unit is dependent upon:

(1) Its parent unit for personnel services.

(2) The field army medical brigade to furnish medical service.

e. Employment.

(1) It is employed from its instrumented airfield. Adequate navigational and lighting equipment is available within the company to permit the company to establish and operate an instrumented airfield. When required, elements of the company may be attached to, or placed in support of, subordinate units of the corps. The corps G2 Air integrates and coordinates the activities of the aerial surveillance company with other agencies and Services. The success of each mission depends upon prior planning and coordination. For this purpose, the company commander and operations officer maintain close liaison with the aviation group S3 and the corps G2 Air.

VI.14 TYPE AIRMOBILE BATTALION, AVIATION GROUP (CORPS).

a. Organization. (Figure VI.4.)

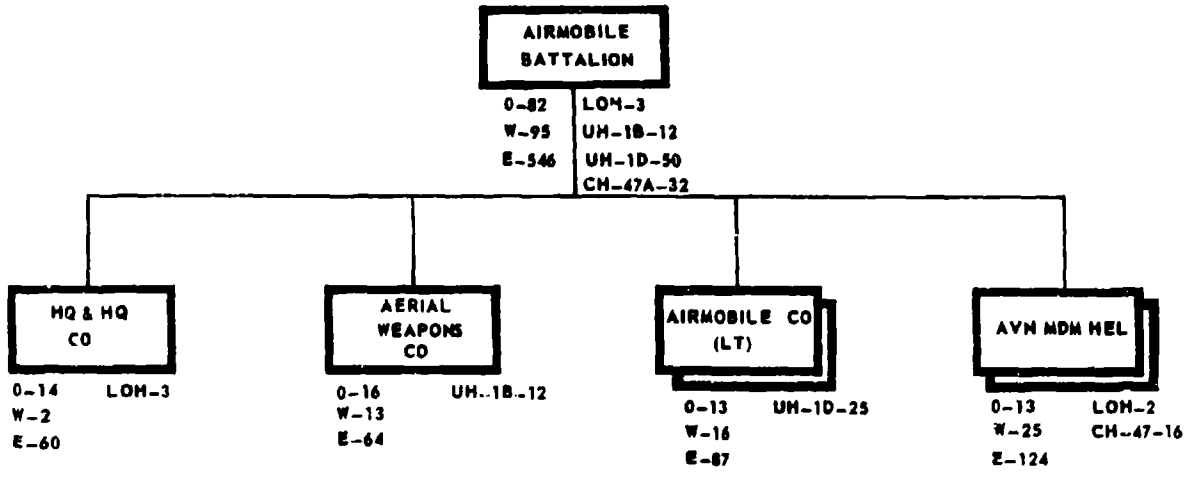


Figure VI.4. Type Aviation Battalion, Aviation Group (Corps).

b. Missions. When the primary mission is tactical transport, the airmobile battalion is assigned to the field army or corps aviation group; when the primary mission is logistical support, it is assigned to the field army support command aviation group.

c. Capabilities. This unit is capable of performing the following functions:

(1) Planning and supervising the employment of attached or assigned Army aviation companies.

(2) Suprevising organizational maintenance and logistical functions of assigned or attached units.

(3) Providing medical services to include emergency medical treatment, operation of aid station, evacuation of sick and injured, and supervision of sanitation.

(4) Independent operations.

d. Limitations.

(1) Dependent upon attached companies for motor maintenance facilities.

(2) Dependent upon the AG personnel services unit for personnel administration.

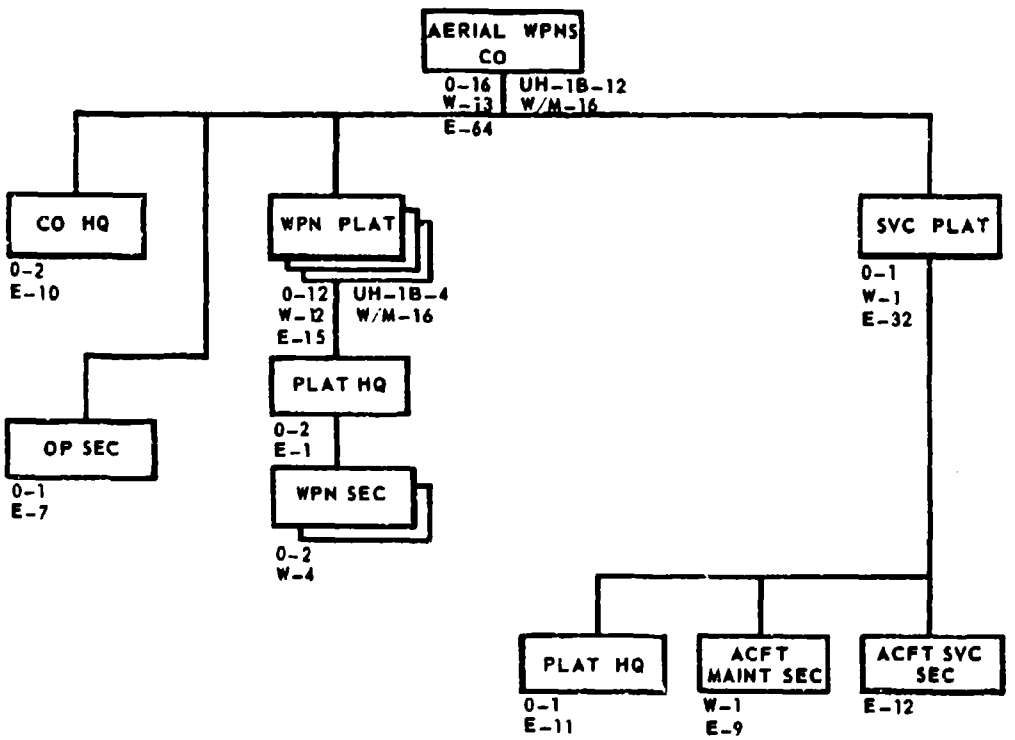


Figure VI.5. Type Aerial Weapons Company, Airmobile Battalion, Aviation Group (Corps).

(3) Employment of the battalion at more than one location will require additional communications equipment and personnel for command and control.

e. Employment.

(1) It is most effective when employed as a unit; however, companies, platoons, or sections may be attached to, placed under operational control or in direct support of other units on a mission basis.

(2) The airmobile battalion headquarters is normally located in close proximity to one of the aviation medium helicopter companies. The two aviation medium helicopter companies and the two airmobile companies (light) are normally employed from their own heliports. The battalion headquarters is normally employed as a single unit; however, its organization is sufficiently flexible to allow the staff to split for operations at more than one location.

VI. 15 TYPE AERIAL WEAPONS COMPANY, AIRMOBILE BATTALION, AVIATION GROUP (CORPS).

a. Organization. (Figure VI. 5.)

b. Mission. The mission of the company is to provide security for airmobile forces and to participate in offensive, defensive, and delaying actions as part of a highly mobile combined arms team.

c. Capabilities. This unit is capable of:

(1) Providing armed aerial escort and aerial fire support of airmobile forces.

(2) Participating in semi-independent operations as required, to destroy enemy forces by aerial firepower.

d. Employment. The company is organized and equipped to operate as a unit; however, platoon-size or section sized teams may be tailored to accomplish a given mission. The aerial weapons company will be used to increase the firepower of the available armed helicopters within the corps. This unit will normally be used to provide armed reconnaissance of the landing zones, including a pre-strike during airmobile assaults. During the conduct of airmobile assaults and extractions this unit will normally provide continuous overhead cover. No less than two aircraft are used on independent missions and two teams of two armed helicopters are required for continuous overhead cover. The company can be employed on numerous independent aerial reconnaissance and security missions. Division should request these resources be made available when brigade-sized operations are planned.

VI. 16 TYPE AIRMOBILE COMPANY (LT), AIRMOBILE BATTALION, AVIATION GROUP (CORPS).

a. The organization, mission assignment, capabilities and organization of the airmobile company (light), airmobile battalion, aviation group (corps) is the same as the airmobile company (light) of the divisional aviation battalion (paragraph VI. 15).

b. Employment. The airmobile company (light) is employed as directed by the airmobile battalion commander. The company performs its mission identically to the divisional airmobile company. This unit may be employed as part of the battalion in airmobile operations, or it may be placed under operational control of a division to augment airlift capabilities. A common mission is the movement of the corps reserve.

VI. 17 TYPE AVIATION MEDIUM HELICOPTER COMPANY, AIRMOBILE BATTALION, AVIATION GROUP (CORPS).

a. Organization. (Figure VI. 6.)

b. Mission. The mission of the aviation medium helicopter company is to provide tactical airlift for combat support and combat service support units to corps and divisional units on a mission basis.

c. Capabilities. The company provides:

(1) One heliport with facilities for instrument terminal air traffic control.

(2) Aerial mobility for combat support and combat service support units under day, night, and near all weather conditions.

(3) Medical evacuation augmentation and aeromedical evacuation.

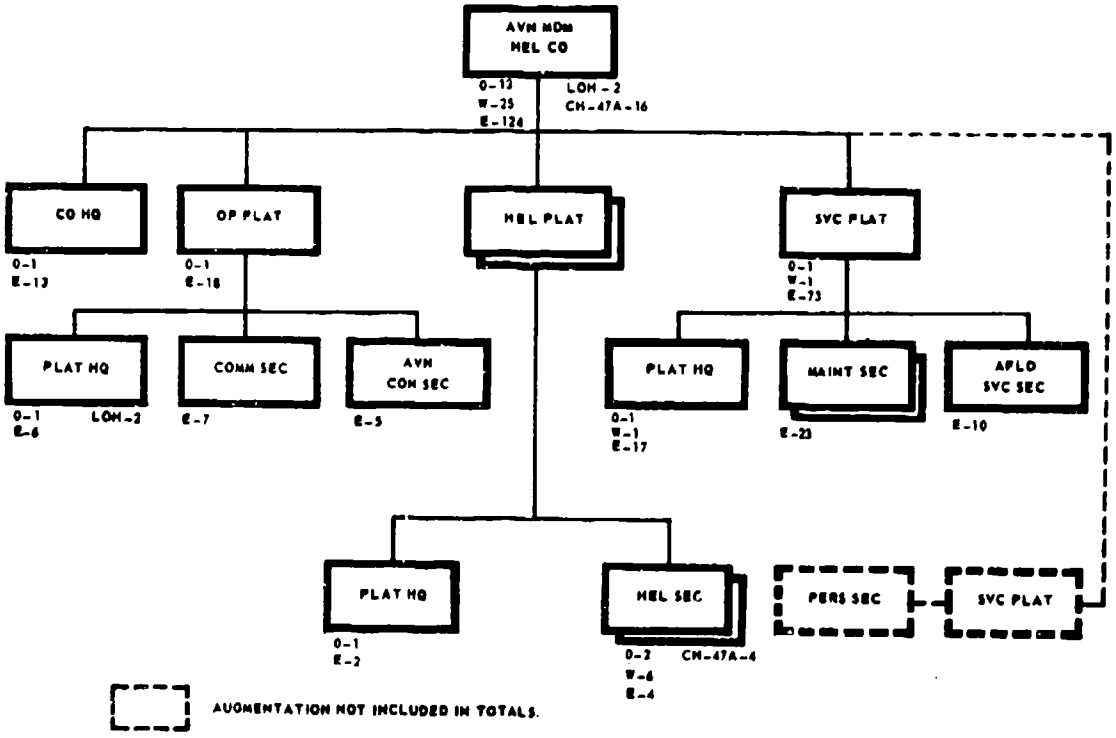


Figure VI. 6. Type Aviation Medium Helicopter Company, Airmobile Battalion, Aviation Group (Corps).

d. Limitations. This unit is dependent upon corps' TAM company for direct support aircraft maintenance, and AG personnel service unit for personnel administrative.

e. Employment. The company is normally assigned to an airmobile battalion and is employed as directed by the battalion commander. The corps aviation group commander, under direction of the corps commander, will employ this unit within its capabilities. The company is normally employed as an integral unit in support of the battalion mission; however, with maintenance support the platoons may be attached to, placed in direct support of, or placed under the operational control of requesting units for specific missions.

(1) The company may be attached to a major corps unit and employed with corps troops. When employed with corps troops, the company may be further attached, placed in direct support of, or placed under the operational control of subordinate corps units.

(2) The company will be further placed in direct support of, or under operational control of, echelons of command capable of providing adequate communications and control facilities. This is normally at division level. In addition, for special or separate missions for a short period of time, the company may be placed under the operational control of a brigade. When operating away from the company, security must be provided by the supported unit.

(3) The communications equipment of the unit is capable of supporting its operations and linking it with higher headquarters.

VI. 18 TYPICAL AVIATION BATTALION (SEPARATE).

a. Organization. (Figure VI. 7.) Depending upon the level at which this battalion is formed, it can consist of a fixed number of units such as the divisional battalion, or it may be a headquarters unit to which subordinate aviation companies are permanently assigned or temporarily attached. The mix of aviation companies can consist of any combination of airmobile companies (light), general support companies, medium helicopter (CH-47A) companies, or heavy helicopter (CH-54A) companies, and any combination of fixed-wing companies with the OV-1B and C Mohawks and the O-1 Birddog.

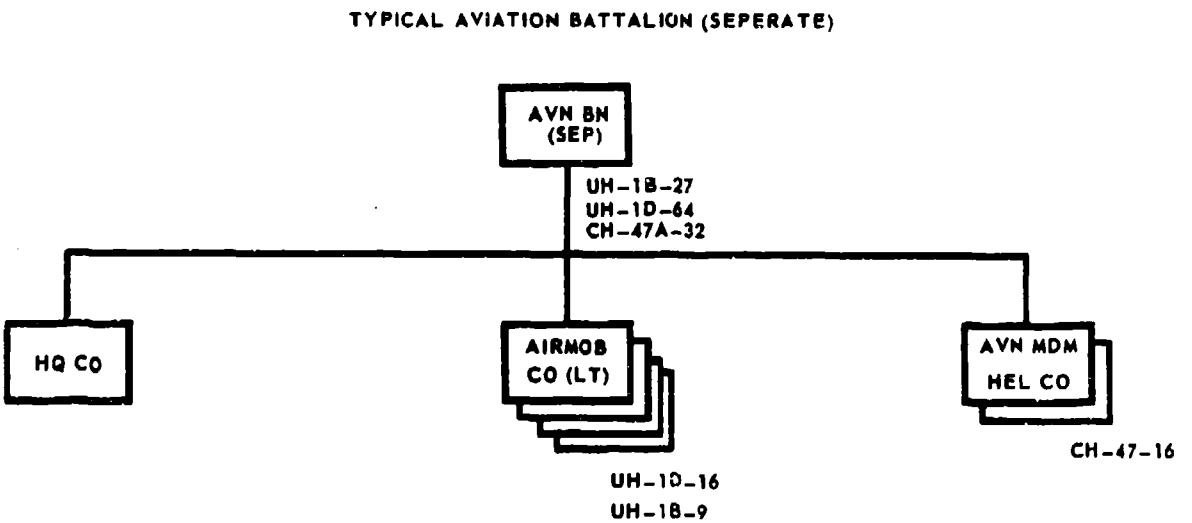


Figure VI. 7. Typical Aviation Battalion (Separate).

b. The mission, assignment, and capabilities of this battalion are basically as covered in paragraphs VI. 14 and VI. 26, with the exception that the firepower is increased due to added UH-1B's.

c. Employment. The battalion will be employed in the same manner as the divisional unit, except that it will normally operate from the base camp. This of course depends on the command relationship established and the duration of the mission. The battalion will be tailored to the specific mission request. Supporting units will then be placed under control of the division aviation officer. During the conduct of the operation, aviation unit integrity is maintained.

VI. 19 TYPE AIRMOBILE COMPANY (LIGHT), TYPICAL AVIATION BATTALION (SEPARATE).

a. Organization. (Figure VI. 8.)

b. The mission, assignment, and capabilities and employment of this company are discussed in paragraphs VI. 15 and VI. 28. The primary difference between these companies results from the reduction of UH-1D's and the increase in UH-1B's. This organization is the common method of tailoring the airmobile company (light) organic to units in Vietnam.

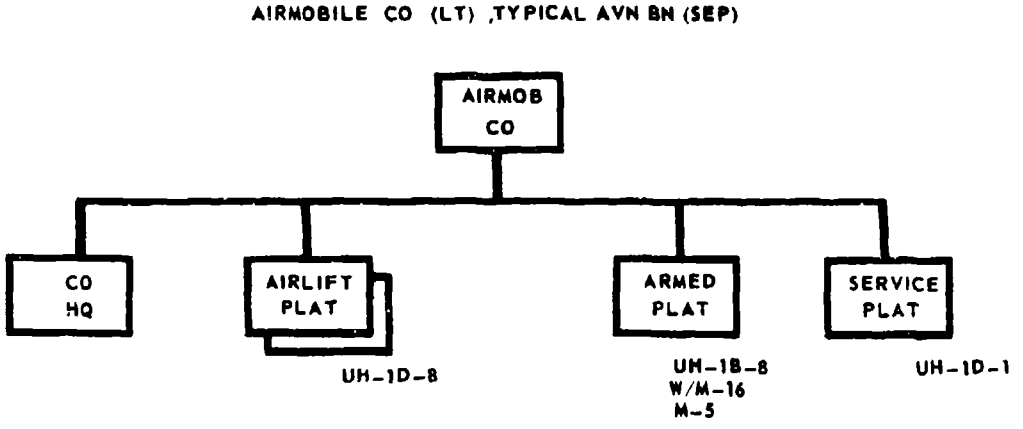


Figure VI. 8. Type Airmobile Company (Light), Typical Aviation Battalion (Separate).

VI. 20 AVIATION COMPANY, SEPARATE BRIGADE.

a. Organization. Applicable TOE.,

b. Mission. The aviation company, separate brigade provides aviation support for the brigade headquarters, the brigade support battalion, and other brigade units without organic aircraft. In addition, the aviation company provides general support and reinforcement to units with organic aircraft.

c. Assignment. This unit is organic to the separate armored and infantry brigade.

d. Employment.

(1) The organic aircraft of the brigade aviation company will be employed in the performance of those aviation tasks which the brigade commander considers of greatest importance to the successful accomplishment of his mission. Operational missions for the

company are assigned by the brigade S3 through the flight operations element of the company headquarters. Missions will be based on priorities and guidance established by the brigade commander. As a matter of priority, the tactical support section is employed primarily for command and control purposes, while the airlift section is used for the movement of troops and supplies. The aero scout platoon will be employed to provide aerial reconnaissance and security to augment the capabilities of the brigade armored cavalry troop.

(2) During the conduct of tactical operations, the aviation company operates from a base within the supported brigade. The tactical support section will establish and operate the brigade heliport in close proximity to the brigade command post. The aero scout platoon, although dependent on the company for services, will operate from forward heliports in the brigade zone. The company has sufficient control personnel and equipment to operate a VFR heliport with terminal facilities. The direct support unit of the brigade support battalion is co-located with the company.

(3) Displacement. During displacement, the ground elements of the company headquarters, aircraft, and aviators displace with supported units. Nonflyable aircraft remain in the rear area with sufficient maintenance personnel to repair them. The direct support maintenance element of the support battalion will evacuate aircraft when necessary.

VI. 21 AVIATION ORGANIC TO ARMORED CAVALRY REGIMENTS AND CORPS ARTILLERY. Army aviation organic to the armored cavalry regiments and corps artillery are so similar in composition, mission, utilization, capabilities and limitations, and employment that the specifics of these units will be omitted here. The practice of placing Army aviation at the lowest required user level is carried out in the assignment of aviation at the higher levels as well as the lower levels. Further details of these units are found in the appropriate unit TOE's.

VI. 22 AVIATION UNITS FIELD ARMY SUPPORT COMMAND. Army aviation units at this level are undergoing dynamic changes due to the recent turn-over of the CV-2 to the US Air Force. Therefore this level will be treated in the light of the units available in Vietnam.

a. Aviation Company (AM-FW) (U-1A OTTER).

(1) Organization. The aviation company (AM-FW) is organized as follows:

(a) The company headquarters, which includes the administrative and supply elements, the operations section, and the communications section.

(b) Two flight platoons of eight aircraft each. Each of these platoons will normally have six of its eight aircraft mission-ready on a continuing basis.

(c) The service platoon and an attached direct support aircraft maintenance detachment.

(2) Mission. The following are missions normally performed:

(a) Air movement of combat and combat support elements.

(b) Air movement of combat supplies and equipment.

(c) Aeromedical evacuation.

(d) Aerial resupply, to include paradrops, and free drop.

(3) Capabilities and limitations.

(a) Capabilities:

1. Perform missions within 100 miles radius without refueling.

2. Transport 8 passengers or 1920 lbs of cargo or a combination of passengers and cargo not to exceed 1920 pounds.

3. Augment other means of medical evacuation (6 litter patients per sortie).

(b) Limitations.

1. Wind velocities in excess of 10 knots will dictate landing or take-off into the wind.

2. The size of the cargo door and compartment restrict the size of packaging for loads to be carried. The U1-A company's LNO can provide information on package sizes which are acceptable.

(4) Planning and coordination. Planning and coordination for operations involving the company are no different than for any other aviation unit and its supported ground unit. The most important factor is the establishment of liaison. For all large operations a liaison officer will be sent from the company as soon as the mission is received to participate in the planning.

(5) Special considerations.

(a) To exploit the capabilities of this type unit an effort should be made to provide productive sorties for each leg of a mission.

(b) POL consumption. This unit uses Avn Gas 115/145 and not JP-4. The company liaison officer should be consulted for POL requirements.

(c) All strips utilized should have some type of ground to air control established by pathfinders prior to the arrival of the first aircraft. Pathfinders may be assigned to the battalion or may be requested through the group.

(d) Organization and preparation of the loading site. Practices that will insure a smooth loading operation are:

1. Have loads prepared (weight marked on loads) by aircraft or chalk number prior to the aircraft's arrival.

2. Use palletized loads whenever possible.

3. Insure that necessary equipment such as fork lifts are available for loading.

4. Insure that all personnel are properly manifested, and properly oriented for efficient loading.

(e) Landing strip. Chapter 7.

(f) Certain special control measures for aerial deliveries. Chapter 7.

b. Aviation company (MDM TRANS CH-47A).

(1) Organization. The company is organized as follows:

(a) Company headquarters, operations and communications section, service platoon, and attached direct support aircraft maintenance detachment.

(b) Two flight platoons of eight aircraft each. These platoons will normally have four of their eight assigned aircraft mission ready on a continuing basis.

(2) Mission. Airmobility for combat support and combat service support elements with priority of movement to artillery and other combat support elements.

(3) Capabilities and limitations.

(a) Capabilities. The company has many capabilities which should be considered by commanders and staffs in planning for and conducting airmobile operations. Some of the most significant are as follows:

1. Day and night operations under visual flight weather conditions and limited operations under weather conditions requiring instrument flight.

2. Tactical movement of 7 - 8,000 pounds per sortie under combat operating conditions, either internally or by sling load.

3. Internal loading of vehicles to include the 3/4 ton truck.

4. Aeromedical evacuation.

5. The ability to discharge or extract troops in heavy jungle by use of the "Trooper Ladder".

(b) Limitations. Effective utilization of the company will require that the commanders and their staffs understand its limitations and plan to minimize their effect on operations. Some of the most significant limitations are:

1. Reduced flexibility of employment during periods of darkness, obstructed visibility, and severe weather.

2. Inadequate organic capability to provide local security.

3. Extensive maintenance support required to permit sustained periods of operation.

4. The large volume of POL resupply necessary to sustain CH-47 operations.

5. No organic capability to provide armed escort for its own operations.

(4) Planning and coordination. Planning and coordination for operations involving the company are no different than for any other aviation unit and its supported ground unit. Establishment of liaison with the supported unit is a most important factor in insuring successful employment of this type aviation unit.

(5) Special considerations. Due to its unique versatility and capabilities, the company may perform a wide variety of tasks; however, care should be exercised to insure that this valuable asset is not wasted through misuse.

(a) Missions which could be more readily accomplished by smaller, more economical, and more easily supported aircraft should be assigned to another type unit, for example, the aviation company (AML).

(b) Movement to and displacement within the battle area of artillery is the priority mission.

(c) The versatility of this unit should be exploited by combining as many missions as possible in a single operation. An example would be to deliver ammunition to an artillery battery in an LZ and to evacuate wounded on the return flight.

(d) Preparation and positioning of loads in an LZ to expedite loading or sling hook-up are requirements for efficient operations. Whenever possible, all aircraft should be loaded immediately upon landing. Since the CH-47A consumes fuel at a relatively constant rate, time lost during loading operations could seriously effect total unit mission capabilities.

(e) POL consumption of the company is a consideration which cannot be over emphasized. Planners who are unfamiliar with the operating characteristics of the CH-47A will invariably underestimate POL requirements. The average fuel consumption of the CH-47A is 260 gallons of JP-4 fuel per hour. Hydraulic fluid and engine oil consumption rates will vary. The company LNO must be consulted to assist in computing POL requirements.

(f) Determination of which types of loading (external or internal) will be based on several variables. Frequently external loading will be dictated because the load is too bulky to be loaded internally. When the size of the load permits a choice, a factor to consider is security. When it is desirable to prevent the load from being seen in flight, obviously internal loading is the logical choice. Time is another determining factor. Properly prepared sling loads may be hooked up and unloaded much more quickly than loads which must be loaded and unloaded internally. Frequently a combination of both methods will be desirable.

(g) Single aircraft missions are possible but not desirable. The aircraft, crew, and type loads are too valuable to be exposed to the possibility of being forced down by enemy action or mechanical difficulty without escort to assist.

(h) Formations used by the company are basically the same as for the aviation company (AML). The use of formations enhances control, decreases vulnerability, and makes optimum use of PZ/LZ space. Additionally, escort and close air support is more effective when oriented on a formation than when concerned with random individual or paired aircraft.

(i) Rotor wash, resulting from hovering operations of the CH-47A, exceeds 60 miles per hour. Care should be exercised in selecting LZ/PZ's in order to avoid dusty or sandy areas and to avoid operations near tents, bamboo or thatch huts, mess areas, and the like.

(j) Pathfinder support is desirable during all operations involving Chinooks.

(k) "Trooper Ladders" should be requested from the supporting aviation unit early in planning if use is indicated. Plans should also be made for troops to rehearse the climbing and descent of this equipment in a secure area prior to the actual operation.

VI.23 MEDICAL AIR AMBULANCE UNITS (FASCOM). See Chapter 4.

VI.24 AVIATION AIR TRAFFIC CONTROL AND TRANSPORTATION AIRCRAFT MAINTENANCE AND SUPPLY UNITS (FASCOM). The ground commander will seldom have cause to come into contact with these units, therefore they will not be discussed here. For information on these units consult the appropriate TOE's.

APPENDIX VII

AVIATION LIAISON OFFICER'S CHECKLIST

VII. 1 ACTIONS PRIOR TO DEPARTURE TO SUPPORTED UNIT:

a. Pick up supporting armed helicopter and pathfinder representatives:

b. Obtain briefing from (S3) (Company Operations Officer):

(1) Supported Unit:

(a) Location:

(b) Contact Officer:

(c) FM frequency:

(d) Call Sign:

(e) Reporting time:

(2) Type mission:

(a) Command reconnaissance requirements:

UH-1D: Gunships: LOH: Other: None.

(b) Special mission requests:

(3) Aircraft mission ready status:

UH-1D: Gunships: LOH: Other: CH-47A:

(4) Allowable cargo load: Troops: Cargo:

(5) Specific problem areas or requirements:

c. Obtain necessary equipment:

(1) Aircraft or vehicle:

(2) Maps, overlays, etc.

(3) Radios, SOI:

(4) Personal gear:

(5) Additional headsets for command reconnaissance if required:

d. Check with (Bn) (Co) Commander for special instructions:

VII. 2 ACTIONS ENROUTE TO SUPPORTED UNITS:

a. Establish communications:

b. Other:

VII. 3 ACTIONS AT SUPPORTED UNIT LOCATION:

a. Report in to supported unit (commander) (S3) (contact officer):

b. Obtain initial briefing on:

(1) Situation:

(a) Enemy:

(b) Friendly:

(c) Ground tactical plan (make map overlays):

(d) Supported unit requirements:

(e) Additional participating aviation units:

c. Brief supported unit on items in paragraph 1b(3) and (4); verify items in 1b(1)(c) and (d); and 1b(2)(b).

d. Assist supported unit in planning:

(1) Loading Plan (Pickup Zone):

(a) Location and description:

(b) Reporting, Station, and Takeoff times:

(c) Size:

(d) Landing formation:

(e) Loads:

1. Troop loads:

2. Cargo loads:

(f) Establish pickup zone release point (PRP):

(g) Special PZ marking procedures:

(h) Communication control procedures:

(i) Loads Control Group Officer (Call sign):

(j) Aircraft marking procedures:

(k) Manifesting:

(l) Traffic pattern:

(m) Priorities:

(2) Air Movement Plan (Flight Route):

(a) Control points:

1. SP:

2. ACP's:

3. CCP:

4. LRP:

(b) Formation:

(c) Altitude:

(d) Escort plan (Armed helicopter flight leader):

(e) Alternate flight routes:

(f) Fire support plan enroute:

(g) Air movement table:

(h) Return routes:

(3) Landing Plan (Landing Zones):

(a) Touchdown time (H-Hour):

(b) Code names and locations:

1. Size and description:

2. Landing directions:

3. Landing formation:

4. LZ Marking procedures:

5. Communications control procedures:

6. Traffic pattern for subsequent lifts:

(c) Preparatory fires and call signs/frequencies:

1. Close Air Support:

2. Artillery:

3. ARA:

4. Aerial fire support:

5. Firing of lift ship armament:

6. Fire plan of de-barking troops:

(4) Refueling requirements:

(a) Location:

(b) Time required:

(5) Aircraft maintenance:

(a) Downed aircraft procedures:

(b) Spare aircraft procedures:

VII. 4 ACTIONS PRIOR TO DEPARTING SUPPORTED UNIT:

a. Finalize and obtain copies of:

(1) Ground tactical plan and overlays:

(2) Landing plan:

(3) Air movement plan:

(4) Loading plan:

(5) Fire support plan:

(6) Alternate plans and subsequent missions:

b. Confirm all times:

c. Last minute weather check:

(1) Mission delay procedures:

(2) Alert procedures:

VII-5 ACTIONS UPON RETURN TO UNIT:

a. Check in with (Bn) (Co) Commander:

b. Brief (S3) (Company Operations Officer) on all information above:

c. Maintain close liaison with supported unit:

VII. 6 MISSION DE-BRIEFING FOR AVIATION UNIT:

VII. 7 AFTER-ACTION REPORT:

APPENDIX VIII

TYPE MISSION DEBRIEFING CHECKLIST AND REPORT

VIII. 1 DEBRIEFING PROCEDURES.

a. The same individual should conduct the preflight briefing and debriefing of aircraft crews. The information is consolidated into two categories - mission and general information.

(1) Mission. During the debriefing, the team is asked questions concerning all aspects of the mission assigned in the preflight briefing.

(2) General. Any additional information obtained which was not an assigned task (such as areas of enemy small arms fire), or any changes in tactical maps and weather data are categorized as general information.

b. Use of a debriefing form will aid the flight crews in compiling mission data and shorten the time required for debriefing.

c. Recording Mission Data. Essential items must be recorded to make the information identifiable and useful for interpretation and intelligence purposes.

VIII. 2 DEBRIEFING REPORT DATA.

a. Estimate of mission results (degree to which mission was accomplished):

b. Enemy activity encountered or observed during mission. Report in the following sequence: (See: Type Report Form).

Line A - WHO made the sighting or observation (acft, mission number and type of mission, if applicable, patrol, higher or adjacent units)

Line B - WHEN the sighting was made:

Line C - WHAT was observed - (enemy, unknown or friendly forces; strength and type of target - tanks, infantry, patrol, bivouac area, include number of items observed; and what they were doing - halted, digging in, moving, - if moving include directions of movement):

Line D - WHERE was the activity sighted (coordinates or cardinal point from geographic location in the clear if the report is of enemy activity):

Line E - Where spot (hot) report made, and if so, to whom (if applicable):

Line F - Strike reports (if applicable):

c. Estimate of aviation portion of mission:

(1) Conduct of operation in the PZ. As planned: Problems:

(2) Flight Route and checkpoints: Adequate: Easily identified:

(3) Formation and altitude: Suitable:

(4) Activity in the LZ: As planned: Alternate:

(5) Communications: Adequate: Excessive:

(a) Air-air:

(b) Air-ground:

(c) SOI-SSI:

d. Aircraft and personnel damage:

(1) Personnel:

(2) Aircraft:

(3) What-When-Where-How:

e. Refueling and maintenance problems:

f. Lessons Learned:

g. Recommendations:

h. After-action Report:

DTG - INITIALS

DEBRIEF REPORT

TO RADIO OPR: _____
TRANSMITTED: _____
POSTED: _____

DEBRIEF (DTG): _____
BY: _____

ITEM NO	A WHO MSG NO;	B WHEN	C WHAT ACTIVITY; NUMBER; DOING WHAT? DIRECTION OF MOVEMENT	D WHERE	E SPOT REPORT MADE - TO WHOM	F STRIKE REPORT

APPENDIX IX

BIBLIOGRAPHY AND READING LIST

AR 55-10	Military Standard Transportation and Movement Procedure (MILSTAMP)
AR 95-Series	Aviation
AR 320-5	Dictionary of United States Army Terms
AR 320-50	Authorized Abbreviations and Brevity Codes
AR 350-1	Army Training
AR 380-5	Safeguarding Defense Information
AR 385-10	Army Safety Program
AR 735-35	Supply Procedures for TOE Units, Organizations, and NonTOE Activities
AR 750-5	Maintenance Organization, Policies, and Responsibilities for Operators
AR 750-8	Command Maintenance Management Inspections
DA TOE's	"G" Series
JCS PUB 1	Dictionary of US Military Terms for Joint Usage (JC)
FM 1-5	Aviation Company
FM 1-10	Army Aviation Organizational Aircraft Maintenance and Supply
FM 1-15	Divisional Aviation Battalion and Group
FM 1-60	Army Aviation Air Traffic Operations - Tactical
FM 1-80	Aerial Observer Training
FM 1-100	Army Aviation Utilization
FM 1-105	Army Aviation Techniques and Procedures
FM 1-110	Armed Helicopter Employment
FM 3-10	Chemical and Biological Weapons Employment
FM 6-20-2	Field Artillery Techniques
FM 7-20	Infantry, Airborne and Mechanized Infantry Battalions

FM 7-30	Infantry, Airborne and Mechanized Division Brigades
FM 8-10	Medical Service, Theater of Operations
FM 8-15	Division Medical Service, Infantry, Airborne, Mechanized, and Armored Division
FM 8-16	Medical Service, Field Army
FM 17-36	Divisional Armored and Air Cavalry Units
FM 21-5	Military Training Management
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FM 54-2	The Division Support Command
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TM 5-330	Planning, Site Selection, and Design of Roads, Airfields, and Heliports in the Theater of Operations
TM 5-366	Planning and Design for Rapid Airfield Construction in the Theater of Operations
TM 6-20-2	Field Artillery Techniques
TM 55-101	Troop Movement Guide
TM 55-450-8	Air Transport of Supplies and Equipment External-Transport Procedures
TM 55-450-9	Air Transport of Supplies and Equipment Internal-Transport Procedures
TM 55-1510-202-10	Army Model O-1A, TO-1A, O-1A (IT), O-1E, TO-1E, TO-1D and O-1F.
TM 55-1520-209-10	Army Model CH-47A Helicopter
TM 55-1520-210-10	Army Model UH-1D Helicopter
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TM 57-210	Air Movement of Troops and Equipment
TC 6-1	Artillery Procedures
TT 1-18-1	Aviation Group, Airmobile Division
TT 1-145-1	Aerial Surveillance Platoon, General Support, Aviation Company, Aviation Group, Airmobile Division
TT 1-156-1	Assault Helicopter Battalion, Airmobile Division
TT 1-165-1	Assault Support Helicopter Battalion, Airmobile Division
TT 6-102-1	Field Artillery Battalion, Aerial Artillery, Airmobile Division
TT 7-15-1	Infantry Company, Airmobile Division
TT 7-20-1	Infantry Battalion, Airmobile Division
TT 7-30-1	Infantry Brigade, Airmobile Division
TT 8-15-1	Medical Service, Airmobile Division
TT 17-95-1	Air Cavalry Squadron, Airmobile Division

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TT 55-8	Air Transport Brigade
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